

MEDICAL REPORTS

FOR THE

HALF YEAR ENDED 31ST MARCH, 1877;

FORWARDED BY THE SURGEONS TO THE CUSTOMS AT THE
TREATY PORTS IN CHINA;

BEING No. 13 OF THE SERIES,

AND

FORMING THE SIXTH PART OF THE

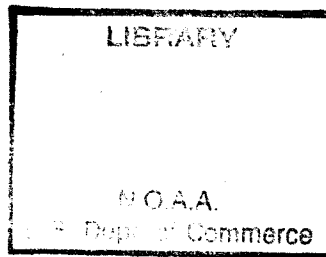
CUSTOMS GAZETTE

No. XXXIII.—JANUARY-MARCH, 1877.

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(1877)

PUBLISHED BY ORDER OF

The Inspector General of Customs.



SHANGHAI:
STATISTICAL DEPARTMENT
OF THE
INSPECTORATE GENERAL OF CUSTOMS.

MDCCCLXXVII.

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National Oceanic and Atmospheric Administration

Environmental Data Rescue Program

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INSPECTOR GENERAL'S Circular No. 19 of 1870.

INSPECTORATE GENERAL OF CUSTOMS,

PEKING, 31st December, 1870.

SIR,

1.—It has been suggested to me that it would be well to take advantage of the circumstances in which the Customs Establishment is placed, to procure information with regard to disease amongst foreigners and natives in China; and I have, in consequence, come to the resolution of publishing half-yearly in collected form all that may be obtainable. If carried out to the extent hoped for, the scheme may prove highly useful to the medical profession both in China and at home, and to the public generally. I therefore look with confidence to the co-operation of the Customs Medical Officer at your port, and rely on his assisting me in this matter by framing a half-yearly report containing the result of his observations at.....upon the local peculiarities of disease, and upon diseases rarely or never encountered out of China. The facts brought forward and the opinions expressed will be arranged and published either with or without the name of the physician responsible for them, just as he may desire.

2.—The suggestions of the Customs Medical Officers at the various ports as to the points which it would be well to have especially elucidated, will be of great value in the framing of a form which will save trouble to those members of the Medical profession, whether connected with the Customs or not, who will join in carrying out the plan proposed. Meanwhile I would particularly invite attention to—

a.—The general health of.....during the period reported on; the death rate amongst foreigners; and, as far as possible, a classification of the causes of death.

b.—Diseases prevalent at.....

c.—General type of disease; peculiarities and complications encountered; special treatment demanded.

d.—Relation of disease to { Season.
Alteration in local conditions—such as drainage, &c.
Alteration in climatic conditions.

e.—Peculiar diseases; especially leprosy.

f.—Epidemics { Absence or presence.
Causes.
Course and treatment.
Fatality.

Other points, of a general or special kind, will naturally suggest themselves to medical men; what I have above called attention to will serve to fix the general scope of the undertaking. I have committed to Dr. ALEX. JAMIESON, of Shanghai, the charge of arranging the reports for publication, so that they may be made available in a convenient form.

3.—Considering the number of places at which the Customs Inspectorate has established offices, the thousands of miles north and south and east and west over which these offices are scattered, the varieties of climate, and the peculiar conditions to which, under such different circumstances, life and health are subjected, I believe the Inspectorate, aided by its Medical Officers, can do good service in the general interest in the direction indicated; and, as already stated, I rely with confidence on the support and assistance of the Medical Officer at each port in the furtherance and perfecting of this scheme. You will hand a copy of this Circular to Dr., and request him, in my name, to hand to you in future, for transmission to myself, half-yearly reports of the kind required, for the half-years ending 31st March and 30th September—that is, for the Winter and Summer seasons.

4.—

* * * * *

I am, &c.,

(signed)

ROBERT HART,

I. G.

THE COMMISSIONERS OF CUSTOMS,—*Newchwang, Ningpo,*
Tientsin, Foochow,
Chefoo, Tamsui,
Hankow, Takow,
Kiukiang, Amoy,
Chinkiang, Swatow, and
Shanghai, Canton.

SHANGHAI, 1st July, 1877.

SIR,

IN accordance with the directions of your despatch No. 6 A (Returns Series) of the 24th June 1871, I now forward to the Statistical Department of the Inspectorate General of Customs, the following documents:—

- A.—Report on the Health of Kiukiang for the year ended 31st March 1877, pp. 1-6;
- B.—Report on the Health of Tamsui and Kelung for the half-year ended 31st March 1877, p. 7;
- C.—Report on the Health of Swatow for the half-year ended 31st March 1877, pp. 8-11;
- D.—Report on the Health of Amoy for the half-year ended 31st March, 1877, p. 12;
- Report on Hæmatozoa, by PATRICK MANSON, M.D., pp. 13-38;
- E.—Report on the Health of Takow and Taiwan-fu for the year ended 31st March 1877, pp. 39-42;
- F.—Report on the Health of Shanghai for the half-year ended 31st March 1877, pp. 43-45;
- G.—Report on the Health of Ningpo for the year ended 31st March 1877, pp. 46-47.

I have the honour to be,

SIR,

Your obedient Servant,

R. ALEX. JAMIESON.

THE INSPECTOR GENERAL OF CUSTOMS,
Peking.

The Contributors to this Volume are—

J. JARDINE, M.D., CH.M.	Kiukiang.
B. S. RINGER, M.R.C.S., L.S.A.	Tamsui and Kelung.
E. I. SCOTT, L.K. & Q.C.P., L.R.C.S.I.	Swatow.
P. MANSON, M.D. CH.M.	Amoy.
T. RENNIE, M.D., CH.M.	Takow and Taiwan-fu.
R. A. JAMIESON, M.A., M.D., M.R.C.S.	Shanghai.
J. H. MACKENZIE, M.D.	Ningpo.

[For the Foot-note in square brackets, page 11, the Compiler is responsible.]

A.—Dr. J. JARDINE's Report on the Health of Kiukiang for the Year ended
31st March, 1877.

DURING the first six months of the period reported on more than the average amount of sickness prevailed in this community. Although last summer was unusually mild, diarrhoea, dysentery, malarial fevers, and a variety of minor ailments were of frequent occurrence. This increase I believe to have been due to the peculiarity of the season; for it was not until July, August and September that it began to be observed. During a summer said by the older natives to have been the mildest for the last twenty and odd years, and specially remarked as being temperate by all foreigners, it would naturally have been expected that the community would have enjoyed at least the usual immunity from disease; and the only probable explanation of the augmentation of miasmatic diseases during these months, is to be found in the flood, which for ten weeks partially deluged our concession and the low-lying surrounding districts. Towards the end of June the water rose over the bund, which has been raised nearly two feet since last year, and subsided in the middle of July, again to rise over its former height by the end of the same month, finally falling permanently in the first week of September. The temperature during the greater portion of that time was on an average little over 83°. When the water subsided, leaving a deposit of alluvium and decaying organic matter behind it, the heat was insufficient to dry this deposit rapidly enough to prevent the exhalation of a quantity of malarious poison. Wherever within the concession itself the miasmatic odour was distinct, precautionary measures were speedily taken by the authorities to counteract its effects by spreading quicklime over the roads and compounds in the more suspicious places. It was at this particular time that sickness was more prevalent than at any other period during the year. Quinine was administered as a prophylactic generally, and, where convalescence in actual attacks was protracted even under its use, a trip to the hills or elsewhere succeeded in restoring health. Here I may mention that in the Lü-shan,—a range about 5,000 feet high, nine miles south of Kiukiang,—this community has a pleasant summer retreat in one of the gorges that intersect these picturesque mountains, which may be regarded as the sanitarium of both Hankow and Kiukiang. The little bungalow there is owned by a company of shareholders, who have prior claim to occupation, but great consideration is always shown to strangers, and specially to the unfortunate invalid, when the little habitation is unoccupied. Consequently, during the greater part of the summer and autumn "the bungalow," as it is called, is invariably tenanted by parties of two, four or even half-a-dozen, who spend the day in enjoying the cool breezes blowing down the gorges, or betimes in bathing and refreshing themselves in the adjacent pool of crystal water—a rare commodity in these regions. Specially during hot summers is such a retreat of priceless value to the invalid.

During the latter half of the year the community was remarkably free from sickness; and I am glad to report that no deaths occurred during the year. With the exception of one case of dysentery, one of broncho-pneumonia, and one of Bright's disease, the members of the Customs Staff have enjoyed excellent health.

The case of chronic Bright's disease, to which I referred in my last report, first came under treatment in July, 1875. This patient,—a member of the Customs Out-door Staff,—had been in China about fifteen

years, and was formerly addicted to habits of intemperance. The first symptom of his complaint was pulmonary oedema, his feet and legs then began to swell, and finally general anasarca of a moderate degree prevailed for some weeks. His urine was examined shortly after he came under observation, and was found loaded with albumen, $\frac{3}{4}$ of the urine in the tube coagulating under the heat and nitric acid test. The quantity passed daily was nearly 40 oz., and its specific gravity varied from 1.015 to 1.023. Hyaline and granular tube-casts were found under the microscope, but were never abundant. Catarrhal symptoms and shortness of breath, with dulness over the base of both lungs, were present for some time. There was slight hypertrophy of the heart; but the liver and spleen were normal.

As his previous history was barren of other etiological indication than excess in ardent spirits, the diagnosis arrived at was cirrhotic kidney due to chronic alcoholism.

After he had steadily pursued for some time the subjoined treatment, his general condition greatly improved. The anasarca, which at one time began to give rise to serious apprehensions, gradually disappeared, leaving little except slight puffiness about the ankles; the urine became less albuminous, (ultimately $\frac{1}{8}$ of the tube coagulating,) and with the exception of an attack of dysentery last summer, and occasional attacks of diarrhoea and vomiting, evidently of uræmic origin, he enjoyed fair health, and was able to discharge his duties until he left for Europe in the end of February, 1877.

With one or two exceptions the plan of treatment pursued was the ordinary one. He was instructed to desist from the use of ardent spirits and wines, to keep himself warmly clad, to have recourse to hot baths twice or thrice weekly, to encourage the action of the skin after them, and to live upon milk and light nutritious food.

At first, thirty drops of tincture of perchloride of iron were ordered thrice daily after food, and a teaspoonful of bitartrate of potash dissolved in a tumbler of water, with the addition of a little sugar and lemon, was taken morning and evening. The iron was found to agree well, and during the progress of the case I was induced to increase the dose to a teaspoonful thrice daily. These large doses were well tolerated, and had evidently the effect of sensibly diminishing the quantity of albumen in the urine. Digitalis relieved the dyspnoea when that was troublesome, and bismuth and magnesia the gastric complications when they arose. Horseradish tea as used by RAYER was tried, and as a diuretic it proved more valuable than the bitartrate of potash, for under its use the dropsy disappeared and did not return.

As a sea voyage has been recommended in such cases, and as change of air always proved beneficial to him, he was, through the liberality of his employers, allowed a year's holiday at home. When he left he continued to take the large doses of iron.

The following case may not be uninteresting to the profession in exhibiting the result of the solvent and preventative treatment of urinary calculi. The history of the case is given in the patient's own words as nearly as possible:—

The patient came to China in 1859 in the capacity of a missionary. On his arrival he was sent to Nan-an-fu, in the south of Kiangsi, adjacent to the Kwangtung province, where he remained for seventeen years. His age is 49 years, and he has enjoyed, until the beginning of the present sickness, good health. Though corpulent, he has no family history of gout, but he has had occasional attacks of dyspepsia. During his residence in China, he has lived upon native food often containing a good deal of vinegar or other acid ingredients. In August 1875, he first began to complain of pain in his loins, specially over the region of the kidneys, which extended in the direction of the ureters into the bladder. The first paroxysm was severe but only lasted one day, when it ceased spontaneously. In December of the same year another paroxysm occurred, which lasted ten days, of increased severity, the pain on this occasion extending to both testicles, especially the right, and along his penis. A Chinese doctor was called in who gave him a little relief by his treatment. Another paroxysm of still greater intensity occurred about 4th June, 1876. Then he was tormented with constant headache, giddiness, noises in his ears, and suffered from nausea, vomiting, general prostration and occasional insensibility. It was then the first stones began to be passed. At this

time a sticky, gleety-looking fluid was voided per urethram almost constantly, but ceased of its own accord some time after the first calculi escaped. From this period his general health suffered greatly, and he continued to pass the calculi, presently to be described, at almost every act of micturition until he came under observation in November last year on his returning to Kiukiang on account of his sickness.

His urine when first examined was strongly acid, and deposited large quantities of urates. Its specific gravity was normal, but it was phosphatic, and contained a considerable quantity of mucus; it was free from albumen, blood and pus.

The calculi were small, varying in size from a millet-seed to a pea. Externally they were of a pale yellow colour, and internally of a reddish yellow tinge. The external thin coating was very friable, but the internal portion hard and not readily pulverized. The external covering proved on examination to consist of phosphates, and the internal composition was uric acid. Their surface was generally studded with minute elevations and irregularities. The patient estimates the entire number discharged at over 1,500. The case was considered one of uric acid concretions formed in the pelves of the kidneys, due to residence in a district where calculous formations are very common, and it may be to the nature of his food.

He was at once put upon the alkaline plan of treatment recommended for uric acid calculi by Dr. ROBERTS of Manchester, to whose experiments and clinical observations the whole profession owes a deep debt of gratitude. Citrate of potash as formed in solution in the following prescription, taken from his classical work on urinary and renal diseases, was what I recommended and prescribed on this occasion:—

“R. Potass: Bicarb: 1½ oz.
Acid: Citric: 504 gr.
Aquam ad 12 f. oz.”

The dose of such a solution for an adult is six or eight fluid-drachms mixed with three or four ounces of water. Two tablespoonfuls were ordered every three or four hours, regulating it so that a dose should be taken every night at bedtime. He was instructed to drink copiously of diluents, to avoid much animal food, vinegar and wines, and live on bland farinaceous diet.

Under this treatment he only passed nine or ten small concretions within the first week after commencing it, the surfaces of which were so smooth that they bore evident signs of dissolution. Since the end of November last year he has not discharged a single stone, his urine has been nearly free from deposit, the pains have entirely ceased, and he is now strong and able to discharge his duties comfortably. What part the change from Nan-an-fu to Kiukiang may have played in producing these happy results, I am unable to say.

For the following Meteorological Table I am indebted to Mr. LOVATT, formerly Harbour Master at this port:—

MONTHS.	THERMOMETER.			RAIN. Inches.	Days on which Rain fell.	MONTHS.	THERMOMETER.			RAIN. Inches.	Days on which Rain fell.
	Highest.	Lowest.	Average.				Highest.	Lowest.	Average.		
1876.	°	°	°				°	°	°		
April	83	53	65 $\frac{1}{5}$	5 $\frac{3}{10}$	9	October ...	82	62	71 $\frac{9}{11}$	1 $\frac{1}{2}$	5
May	93	62	75 $\frac{10}{11}$	8 $\frac{3}{10}$	8	November	72	44	55 $\frac{5}{8}$	3	7
June	90	70	79 $\frac{2}{5}$	9 $\frac{13}{20}$	15	December	61	38	50	$\frac{9}{20}$	4
July.....	96	87	87	4 $\frac{3}{10}$	8	1877.					
August ...	90	80	85	1 $\frac{1}{2}$	7	January ...	58	28	42	3 $\frac{6}{10}$	7
September	94	66	79	2 $\frac{3}{10}$	6	February..	70	28	37	7 $\frac{7}{10}$	9
						March.....	73	35	56	3 $\frac{1}{2}$	8

In October last the river fell 7 ft. 4 in. ; in November 10 ft. 5 in. ; and in December 9 ft. 4 in.

Among the Native cases seen during the year, the following have a certain degree of interest attached to them:—

Rupture of Urethra.—A native carpenter, while engaged in erecting the framework for the roof of a house, fell from some distance astride the sharp edge of a piece of planking. When first seen about an hour after the accident, blood had flowed copiously from the urethra, his perinæum was swollen, and he experienced considerable pain in that region. I at once tried to pass a full-sized flexible catheter, but on account of the copious hæmorrhage from the urethra, excited by the instrument removing the coagulum, I was after some cautious attempts obliged to desist. Cold was ordered to be applied to the region, the patient was admonished not to attempt to void any urine for fear of extravasation, and he was ordered to remain quiet. Returning in twelve hours the bladder was found considerably distended above the pubis, the perinæum and scrotum much swollen and ecchymosed, and the urethra filled with coagulum. Attempts were again made to pass an instrument, but the hæmorrhage became even more alarming than on the previous occasion, blood flowing like urine from the urethra and coagulating where it fell, so that further attempts could not with propriety be continued.

As, however, the bladder must be relieved at all hazards, the following three methods naturally suggested themselves for consideration:—(1) to puncture the viscus from the rectum by trocar and canula; (2) to incise the perinæum along the medium raphé, turn out any coagulum, arrest hæmorrhage, secure the divided ends of the urethra and pass an instrument into the bladder; (3) to draw off the urine by aspiration above the pubis. As the latter method seemed fraught with least danger, and as it could be repeated from time to time if occasion should demand it, this was preferred. Two quarts of clear urine were drawn off without any trouble or inconvenience to the patient, who expressed himself as greatly relieved. Ten hours afterwards he was again visited and an instrument successfully passed without much bleeding to interfere with my manipulations in guiding it along the upper surface of the canal. Evaporating lotions were applied to the contused region, the instrument tied into the bladder and a dose of opium administered. The scrotum was looking then so suspiciously blackened that apprehensions of extravasation of urine into its loose textures were entertained, but it was thought better to wait a few hours and watch. As the blackening did not extend, and no constitutional symptoms arose, it was decided not to interfere. When visited on the following morning, the patient, contrary to imperative instructions, had removed the instrument, but he informed me that he had passed water quite well without its aid, and refused to submit to further treatment. He recovered without a bad symptom. He was in vain urged to come and have an instrument passed occasionally to prevent contraction of the canal; and it was only two months afterwards that he returned with a bad stricture, through which even one of the finest French instruments could not be passed.

As the Chinese are proverbially such a quietly-moving race, fractures are rarely met with here. One case of fracture of the middle of the femur, and one of the frontal bone, both the result of falls, have been successfully treated during the year.

The fracture of the femur, which occurred in a girl eleven years of age, was treated by the now old fashioned long splint. I have hitherto obtained such satisfactory results from it that I am unwilling to abandon its use in favour of the method of extension by weights and pulleys. In this case there was no shortening of the limb, and with the exception of a little thickening of the bone at the seat of fracture, there was no difference in it from the sound one.

The fracture of the frontal bone, between the right frontal eminence and the supra-orbital ridge, was the result of a fall over the bund, and was complicated with laceration and severe contusion of the scalp. There was a lacerated wound in the right occipital region, two inches in length, denuding the bone to about the size of a crown piece. Both wounds healed kindly by second intention (though treated antiseptically) on account of the bruising of the scalp, and the probable presence of sand in the wound. The fracture was merely linear, and did not give rise to any symptoms.

The following notes of obstetrical cases visited during the year in this neighbourhood will give a fair idea of the difficulties encountered by foreign practitioners in dealing with difficult midwifery among the natives. Skilled assistance is never summoned until all hope has fled, and the patient is exhausted. The foreign doctor is then invited to undertake the case, probably to be met by a messenger on the way announcing that the woman has in the meantime died; often to find the patient so collapsed that he dare not do anything lest she should die in his hands; sometimes to find sloughing of the vagina from days' pressure of the foetal head; or as frequently, to find that an arm has been presenting for seventy-two or eighty hours, and the uterus grasping the child as in a vice, so that no remedy remains but the most repulsive operation in the whole domain of obstetric surgery.

1.—Was asked to visit the wife of a native banker who had been three days ill; an arm had been protruding for two days, and the uterine pains had ceased. This was her second pregnancy; her first confinement lasted six hours. Having to go some distance to visit her, on my arrival seven hours after the messenger was despatched for me, I found that she had got well without assistance, evidently by spontaneous expulsion. The arm did not recede, but was followed by the body, the lower extremities, and lastly by the head. Doubtless in this case the pelvis was extra-capacious. Both mother and child did well.

2.—The woman in this case had been in labour six days. There was no external presentation, and this was her first pregnancy. Received a message on the way, requesting that I should not trouble myself further, as the woman had died.

3.—Third pregnancy; left arm presenting; had been two days in labour; pains regular and expulsive; previous labours had been safe and easy. Attempts were made to perform version, but the pains were too powerful. Regular doses of morphia and tartar emetic were given until the pains ceased and nausea was produced, when version was successfully performed. Both mother and child did well.

4.—Previous history not ascertained. Had been in labour six days; right arm presenting; external parts oedematous; tenderness over the whole abdomen; pulse 130; tongue dry; no pains for three days; no vomiting, but there was great exhaustion. At the earnest solicitation of her husband, podalic version was successfully performed after administering stimulants. She survived until next day; the child was stillborn.

5.—Called to relieve a case of retained placenta; labour had been natural and completed about midnight; at 9 A.M. next morning, when examined, the retention was found due to "hour-glass contraction" of the uterus; gradual dilatation by the hand and gentle traction relieved her of it.

6.—First labour; age 19; has been ill for nine days with regular pains (?); bowels confined; pulse and general condition good. On examination presentation was normal, but the os not fully dilated. Ordered enema, and gave as my opinion that she had been in labour only a few hours and that further interference was unnecessary. Returned next day and found labour safely terminated.

7.—Age 20; first pregnancy; has been in labour nine days; labour pains had continued for the first two days, when they ceased, external parts were greatly swollen, and abdomen unusually distended, but not tender to pressure; pulse 96 and small; has not passed any urine for seven days; head presenting in hollow of sacrum; unable to pass a catheter into the bladder, evidently on account of pressure. The foetal head was pushed a little upwards, an instrument introduced, and an enormous quantity of urine drawn off. When the forceps was applied a small quantity of very foetid pus escaped; the child, which was easily extracted, had begun to undergo decomposition, and fears are entertained for the integrity of the maternal passages and for septic poisoning. The catheter to be used twice daily; and passages washed with weak Condy and water by means of Higginson's syringe. Result yet unknown.

Four cases of opium poisoning were treated, of which three recovered and one died. The man who died was brought to me moribund, fifteen hours after taking. It was said, one tael of

opium. As ordinary means proved useless in this case, I injected subcutaneously $\frac{1}{60}$ of a grain of atropine, which had the effect of strengthening and accelerating the pulse to some degree. The pupils not being affected in twenty minutes, it was repeated, and again after a similar lapse of time. This dilated the pupils after a few minutes, but the patient never rallied, and died seventeen hours after taking the fatal dose. The stomach had been washed out with the stomach-pump.

Gold-leaf poisoning appears to be seldom practised here as a method of committing suicide, as I have heard of only one case during my three years' residence. In March 1877, I was asked if an antidote could be furnished for this aristocratic method of poisoning. Being anxious to meet such a case, a favourable opinion was advanced if the patient could be brought for treatment. This, however, was not done, and how the case ended is still unknown. Gold-leaf, where it does not suffocate, must act simply as an irritant, and therefore I should consider that the rational treatment would be the continuous exhibition of alkalies, with demulcent drinks and emetics,—but how far they might succeed in practice remains to be proved.

Worms in the Heart of Dogs.—During the past year there has been an alarming mortality among foreign dogs of all kinds, and in nearly every case where the dog has been dissected, death has been found due to worms in the heart. The left ventricle has in some instances been almost completely filled with them; but I believe that as long as these creatures remain in the cavities, they are comparatively harmless, and that it is only when they obstruct the passage of blood through the orifices, or impede the action of the cardiac valves, that they prove fatal. The whole circulatory system has been examined on two occasions, as well as the blood microscopically, but no clue can be got to their origin. [See Dr. MANSON'S investigations, further on in this volume.]

B.—Dr. B. S. RINGER's Report on the Health of Tamsui and Kelung, for the
Half-year ended 31st March, 1877.

DURING the past winter months the health of the foreign community of Tamsui and Kelung, including the staff of mining experts now settled at Coal Harbour, about three miles from Kelung, has been remarkably good.

One or two slight cases of intermittent fever occurred, which rapidly yielded to quinine.

One case of small-pox has to be noted. The patient contracted the disease in the country, and after passing through the usual stages, finally recovered with very slight pitting.

No deaths have to be recorded.

DISEASES AMONGST NATIVES.—During last year (1876), 1,356 Chinese patients were seen at the Mission Hospital.

The following list will show the proportion of the various diseases:—

Diseases of the Eye	320	Ulcers	56
„ „ Alimentary Canal . . .	155	Venereal diseases	43
Debility	130	Toothache	25
Rheumatism	127	Nervous affections	11
Diseases of the Skin	124	Nasal Polypus	8
„ „ Respiratory Organs . .	99	Opium Smoking	7
Ague	80	Fistula	6

And sundry cases of Surgical Injury.

C.—Dr. E. I. Scott's Report on the Health of Swatow for the Half-year
ended 31st March, 1877.

IN the subjoined Table I have classified the diseases which came under my notice among foreigners during the half-year. I have also noted the rates in which residents and visitors contributed to the list, the "visitors" consisting chiefly of persons on board ships in harbour.

	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH.	TOTAL.	RESI- DENTS.	VISITORS.
A.—ZYMOTIC DISEASES.	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>
1. <i>Miasmatic Diseases:—</i>									
Small-pox	—	—	—	—	—	1	1	1	—
Tonsillitis	2	—	1	—	—	—	3	2	1
Intermittent Fever	2	4	2	1	2	5	16	5	11
Remittent "	—	—	—	1	1	1	3	3	—
Erysipelas	—	—	—	—	—	1	1	—	1
Boils	—	—	—	—	—	2	2	—	2
Influenza	—	—	—	—	—	2	2	2	—
Dysentery	—	—	—	—	—	2	2	—	2
Diarrhoea	3	6	5	3	—	2	19	12	7
2. <i>Enthetic Diseases:—</i>									
Primary Syphilis	1	10	1	1	1	1	15	1	14
Secondary "	—	3	3	1	—	1	8	1	7
Syphilitic Iritis	1	—	—	—	—	—	1	—	1
Gonorrhoea	2	5	2	—	—	4	13	1	12
Bubo	—	—	1	1	—	—	2	—	2
Orchitis	—	1	3	1	—	—	5	1	4
Stricture of Urethra	—	—	—	2	—	1	3	1	2
3. <i>Dietic Diseases:—</i>									
Scurvy	—	—	—	—	—	1	1	—	1
Ebriositas	—	1	—	1	—	—	2	—	2
4. <i>Parasitic Disease:—</i>									
Tape-worm	—	1	1	—	—	—	2	—	2
B.—CONSTITUTIONAL DISEASES.									
1. <i>Diathetic Diseases:—</i>									
Gout	—	1	1	—	—	—	2	2	—
Rheumatism	—	2	1	1	—	2	6	1	5
Anæmia	—	—	1	—	—	—	1	—	1
Asthma	1	1	—	—	—	—	2	1	1
2. <i>Tubercular Diseases:—</i>									
Consumption	—	—	1	—	1	1	3	1	2
C.—LOCAL DISEASES.									
1. <i>Diseases of Nervous System:—</i>									
Epilepsy	1	—	—	—	—	—	1	—	1
Tetanus	—	—	—	1	—	—	1	—	1
Convulsions	—	—	—	—	1	—	1	1	—
Laryngismus	—	—	—	—	—	1	1	1	—
Neuralgia	—	1	1	2	2	3	9	7	2

	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH.	TOTAL.	RESI- DENTS.	VISITORS.
<i>C.—LOCAL DISEASES, continued :—</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>
2. <i>Diseases of Circulatory System :—</i>									
Mitral Valve Disease	—	1	—	—	—	—	1	—	1
3. <i>Diseases of Respiratory System :—</i>									
Epistaxis	1	—	—	—	—	—	1	1	—
4. <i>Diseases of Digestive System :—</i>									
Gastritis (Catarrh of Stomach)	—	8	—	—	—	—	8	—	8
Constipation	—	—	1	—	1	—	2	1	1
Dyspepsia	1	—	1	—	—	—	2	1	1
Piles	—	—	1	1	—	—	2	1	1
Inflammation of Spleen	—	—	1	—	—	—	1	—	1
„ „ Liver	—	—	1	—	1	—	2	—	2
Jaundice	—	—	1	—	—	—	1	—	1
5. <i>Diseases of Urinary System :—</i>									
Inflammation of Bladder	1	1	—	—	—	1	3	1	2
6. <i>Diseases of Integumentary System :—</i>									
Roseola	—	—	—	1	—	—	1	1	—
Urticaria	—	—	—	—	—	1	1	1	—
Herpes	—	1	—	—	—	1	2	2	—
Psoriasis	—	—	1	—	—	—	1	—	1
Ring-worm	—	—	—	1	—	—	1	—	1
Whitlow	—	—	—	—	—	1	1	—	1
Abscess	1	—	—	—	—	—	1	—	1
Ulcer	—	1	1	—	—	—	2	—	2
7. <i>Diseases of Eye :—</i>									
Granular Eyelids	1	—	—	—	—	1	2	—	2
<i>D.—LESIONS FROM VIOLENCE TENDING TO SUDDEN DEATH.</i>									
1. <i>Accidents :—</i>									
Dislocation of Shoulder	—	—	—	1	—	—	1	—	1
Sprain	—	—	—	—	—	1	1	—	1
Contusion of Head	1	1	—	—	—	—	2	—	2
Concussion of Chest	1	—	—	—	—	—	1	—	1
Gunshot Wound	1	—	—	—	—	—	1	—	1
Incised Wound of Head	—	—	1	—	1	—	2	—	2
„ „ Throat	—	—	1	—	—	—	1	—	1
Frost-bite	—	—	1	—	—	—	1	—	1

This table compares very favourably with the returns for the summer months. Under the head of miasmatic diseases there has been a marked falling off. Of intermittent fever there have been only 16 cases observed, against 52 during the previous half-year. Diarrhoea also has been less prevalent than during the summer months, there being 19 recorded cases against 25 during the summer. There has been no very severe case here under this class of diseases among foreigners.

Small-pox is supposed to have been epidemic among the Chinese in and around Swatow for several months past, but the difficulty of arriving at any correct information on the subject has been very great. I believe, however, that it was very prevalent, and in many instances of a very severe form; many Chinese applied for vaccine lymph, and told me that small-pox was raging in these districts. This may or may not have been the case. No doubt the native vaccinators would magnify the amount of the disease as much as possible, in order to induce the

people to get vaccinated, and thereby push a thriving trade. Vaccination seems to be extensively practised in this district. Dr. GAULD, whose dealings with the Chinese are very extensive, corroborated the statement of a small-pox epidemic. I met with only one case of small-pox among foreigners here. This was a boarding-house keeper living in the Chinese town, and was very slight. It is surprising that all classes of infectious diseases are not more common than they are among the natives, considering the filthy state of the native town of Swatow, and its very imperfect drainage.

Frost-bite.—A very severe case came under my care last December. The sufferer, a Malay sailor, came here from Chefoo, where he had got frost-bitten. When he was first attacked by the cold, he put both his feet into warm water. On his arrival here on December 26th, the left foot was quite gangrenous and a line of demarcation was forming about two inches above the ankle. I at once saw there was no hope of saving that leg, and determined to amputate it as soon as possible. The toes of this foot were sloughing off and the tendons were bare, though there were as yet no bones protruding through the skin. The right foot was not so bad—the toes were going, but the tendons were not bare and there was no distinct line of separation. The patient had suffered much pain, and after many sleepless days and nights and little nourishment, was in a very low and feeble condition. On the 27th, finding there was no possibility of saving the left foot or of improving the man's condition, I performed a double flap amputation at the lower third of the leg, having first applied ESMARCH'S bandage.

There was no blood lost during the cutting part of the operation, and very little lost in tying the blood-vessels. The stump healed almost entirely by first intention, and all the ligatures came away on the seventh day. The right foot had in the meantime become very bad, and was separating through the ankle joint, leaving the bones of the leg bare. I determined therefore to amputate this leg also, in the same place and manner as the other, and on January 10th I operated. This stump healed up nearly as the other had done, the ligatures came away on the tenth day. There was a little blush of redness over the edge of the tibia and a tendency to ulcerate there, but there was no constitutional disturbance of any kind; the pulse was steady and tolerably strong, temperature continued between 99° and 100° Fahr., the bowels were open, and the patient ate well and took a little wine. He gave no sign of any coming trouble, except occasional fits of weeping and depression on account of the loss of both feet, and anxiety for his future. He smoked constantly. On January 22nd, as I paid my morning visit, I noticed the pulse had gone up to 120, the temperature being 104° Fahr. His expression was anxious, but he said he was well. On looking at the right stump, I found that there was a good deal of pus coming through an opening through which some of the ligatures had passed, and on gently pressing the stump I got away an ounce or more and fancied that this accumulation was the cause of the sudden change. The same evening I tried to get more matter from the same place, but the stump was quite clean, and no matter came by pressure. I then noticed for the first time a spasmodic twitching in the right stump below the knee. He was able at this time to lift the left leg from the bed, and used, contrary to my wishes, to try and bend the stump on the thigh. At first I fancied he was endeavouring to perform the same manœuvre with this leg; but he denied this, and wondered why he could not keep his leg quiet. At present the spasms were not very severe and he did not complain of pain. I gave him at once sixty grains of chloral, and ordered the dose to be repeated every four hours if the spasms continued.

January 23rd.—The stump quite clean; tongue dry; no change in pulse and temperature. Spasms in right leg very severe and accompanied with great pain. At each spasm the leg was firmly flexed on the thigh, and this occurred at intervals of two or three minutes, lasting perhaps ten seconds. I increased the dose of chloral to ninety grains every three hours, and endeavoured to control the spasms by holding the leg with the hand. At first the pressure gave relief, but after a time it seemed to do no good.

24th.—Spasms becoming more general, the back being slightly affected; he had not well marked opisthotonos, yet he cried that his back was getting as bad as his leg. He was quite conscious, and swallowed beef-tea and wine as often as they were given to him. He slept very little, though he took the

chloral regularly. The chloral seemed to lessen the severity of the spasms for a time after each dose, but they increased again as another dose was coming due. The patient continued in this state till January 31st, when he died. There was no apparent cause for the tetanus.

In all the cases of neuralgia which have come under my notice, though I have employed the *Gelseminum sempervirens*, I find it is by no means a universal cure, though it often affords immediate relief. I have one patient who is subject to attacks of facial neuralgia to whom I give twenty minims of the tincture as soon as the attack begins, and she gets relief almost as soon as she drinks the medicine.

A very interesting case of hæmorrhage from the nose and bowels came under my notice:—

The sufferer was a child of eight years, very small and badly developed, and very anæmic, with blanched eyelids and lips. He had been subject for years to violent bleedings from the nose on the least provocation. On one occasion he received a blow on the ear which set up hæmorrhage from the nose which was stopped with difficulty. He had never had any serious illness; never had measles, but was always delicate. On several occasions he had passed blood by the bowels, which caused his parents much anxiety, and on account of which I was consulted. The first time I saw him I was shown a pillow saturated with blood which had come from his nose during sleep. I was told it was a common thing for him to lose as much blood as I saw, and that he usually bled three nights in a week, and always bled at night unless he met with an accident in the daytime. He was lively and running about, and eating well. He usually slept heavily all night and did not know when the bleeding began. I fancied he must injure his nose in some way during sleep, and had him watched till the next hæmorrhage took place, but I did not watch him myself. It was observed to commence without any injury as the child lay fast asleep, and to flow very gently from both nostrils. He slept on unconsciously and the bleeding stopped eventually by the nostrils getting filled with clots. I do not know how much blood he lost at each bleeding, but the amount must have been considerable, judging from the saturated pillows I frequently saw. I thought this a favourable case to try the hæmostatic power of ergot, and ordered the child half a drachm of the liquid extract, with ten minims of tincture of iron three times daily and a good generous diet, forbidding any fatiguing play or exercise. Under this treatment he gradually improved, the hæmorrhages became less frequent, and in three months had ceased almost entirely.

He has since left this port, so that I shall have no opportunity of seeing whether the attacks will recur or not. Nevertheless, it is an encouraging case, and should I meet with others similar, I will again use the ergot.

A very severe case of inflammation of the bladder is worthy of record on account of its exciting cause, which was the injection of undiluted black carbolic acid into the urethra for supposed gonorrhœa. I need hardly say that this was amateur treatment, and that the results were very alarming; this accident was a very severe one, and I think unique of its kind.*

I have to record three deaths: one the Malay above mentioned, from tetanus; one a chronic case of paralysis of five years' duration; one a case of convulsions in a child ten days old. There have been seven births,—six boys and one girl, all natural labours.

[* A somewhat similar case occurred in my practice several years ago. A man who was expecting from home a girl to whom he was long engaged, was unlucky enough to contract gonorrhœa. As soon as the running was established, he forcibly injected a large pewter syringeful of boiling congee water. A couple of hours afterwards, when I saw him, his condition was deplorable. I bled him to faintness, and kept him in a tepid bath for three days. The secretion of urine was thus rendered almost nil. Subcutaneous injections of one grain of morphia were administered three times daily. In about a week convalescence was established, but the stream of urine was reduced to a mere dribble, which went on nearly all day. With infinite trouble a whalebone bougie, No. 2 French scale, was got into the bladder ten days after the accident. This I left for three days, making the patient pass water without disturbing it. At the end of this period a No. 4 English scale was passed without much difficulty and was retained for two days. I then fully divided four strictures—one immediately in front of the bulb, and three in the penile portion. Recovery was complete in about six weeks. The gonorrhœa, by the way, did not reappear.]

D.—Dr. P. MANSON'S Report on the Health of Amoy for the Half-year ended 31st March 1877.

THE following observations of Temperature and Rainfall during the six months were taken, the former at the Custom House, Amoy, the latter on Kulangsu:—

—	HIGHEST.	LOWEST.	RAINFALL.
1876.			
October	84°	67°	<i>Nil.</i> Inches.
November	78°	61°	0·96 ”
December	75°	54°	5·01 ”
1877.			
January	67°	50°	<i>Nil.</i> ”
February	66°	44°	2·12 ”
March	73°	53°	3·49 ”

The Thermometers were read six times in the twenty-four hours, commencing at 4 A.M.

The total rainfall for 1876 was 55·09 in., being an amount much in excess of the average.

There has been no epidemic, either among Chinese or Foreigners.

The following deaths have been recorded:—

Pulmonary Consumption 1 European.
 Chronic Dysentery 1 ”
 Small-pox 1 Indian.
 Softening of the Brain 1 Malay.
 Congestion of Lungs—dilated Heart 1 ”

Of the above, three occurred on shore, viz., the cases of pulmonary consumption, chronic dysentery and softening of the brain. The subject of consumption was a member of the Customs Lighthouse staff. The case of dysentery was imported from South Formosa, where the subject of it, a Spanish priest, had been living at a most unhealthy station, and where he had suffered from malarial fever. He contracted dysentery about three months previous to his arrival at Amoy.

REPORT ON HÆMATOZOA, by PATRICK MANSON, M.D.

ALLUSION has been made by Drs. SOMERVILLE and JAMIESON, in recent numbers of these Reports, to a condition known as "worms in the heart," to which the dog in China is peculiarly liable. Any one who has had much acquaintance with dogs in these parts must be aware of their liability to sudden and apparently unaccountable death; and the medical practitioner is often asked to perform a post-mortem examination with the view of clearing up or confirming the suspicion of poisoning which is so commonly entertained in such cases. Ten chances to one the cause of death is found to be plugging of the pulmonary artery, or mechanical interference with the action of the valves of the heart, by a mass of filariæ occupying the artery and cavities of the right side. I have had many opportunities of seeing this affection. I am aware that a similar disease is known in America, France and Italy, and probably elsewhere, and that the "worm" has been more or less carefully described by various authors; but as I presume that, like myself, most medical practitioners in China do not possess works on the subject, and have no opportunity of consulting them, my observations may be of some value notwithstanding their crudeness.

Prevalence of Entozoa amongst Dogs in China.—Besides the usual and well known external pests, there is quite a large number of different parasites infesting both foreign and Chinese dogs. I am familiar with at least five species occupying the alimentary canal, viz., two kinds of tænia, a thread-worm inhabiting the small intestine, and two round worms like the human lumbricus. In addition to these is the heart-worm, variously named *Filaria canis cordis* or *Filaria immitis*, and a new species, not hitherto described as existing in the dog in China, the *Filaria sanguinolenta*. The latter I have alluded to in a former report, (C. M. R. No. 10, p. 9) as having been discovered by Dr. LEWIS in the pariah dog of Calcutta, and most of his observations I have been able to confirm. I propose to describe both *Filaria immitis* and *Filaria sanguinolenta*, as an acquaintance with the appearance and habits of both is necessary to understand the lesions they produce, and to prevent mistakes and false conclusions on an important point in the history of *Filaria immitis*, viz., the process by which it obtains access to the circulation of its host.

FILARIA IMMITIS.

Its Prevalence.—The extent of this is difficult to estimate without much and laborious investigation, but if I say that one-half of all dogs in China (my remarks apply especially to Amoy), whether native or foreign, are the hosts of this parasite, I believe I am within the truth; two out of three is nearer it, and is not, I think, an over-statement. Any one can satisfy himself on this point by examining with the microscope the blood of the first half-dozen dogs he can procure, and to do so it is not necessary to kill the animal.

Mode of examining the Blood for Embryos.—The plan I adopt is to make a small incision with a sharp knife on the inner surface of the ear, where the skin is not covered by hair, and from this to express sufficient blood to supply six or eight slides. These I carefully search with a low power, and the probability is, that in one or all of them one or more immature filariæ will be discovered. From observations thus made, and in some cases confirmed by post-mortem examination, the following Table has been drawn up, and I conclude from it that dogs of all ages, and probably every breed, are liable to be attacked by the parasite I am describing.

No.	BREED.	SEX.	AGE.	WHERE FROM.	LIVED IN CHINA.	CONDITION.	NO. OF SLIDES EXAMINED.	AMOUNT OF HÆMATOZOA.	LIABLE TO ANY FORM OF DISEASE.
1	English Terrier	F.	9 yrs.	Amoy	9 yrs.	Well nourished	—	Abundant	Died suddenly.
2	Pups of above	—	6 weeks	"	6 weeks	Good	2 from each	None	—
3									
4									
5	Spaniel	M.	—	England	—	"	6	Very abundant	Canker in ears.
6	Newfoundland	"	3 yrs.	Hongkong	3 yrs.	"	12	Two	—
7	Eurasian, large	"	1 ¼ "	Amoy	1 ¼ "	"	6	None	—
8	" small	"	1 ½ "	"	1 ½ "	"	6	"	—
9	Peking Terrier	"	—	—	—	"	6	"	Canker.
10	Italian Greyhound	"	—	—	—	"	6	"	—
11	Bull-terrier	"	1 yr.	Amoy	1 yr.	"	6	One	—
12	Dropper,—Setter,	"	5 ½ "	At Sea	5 ½ "	"	1	"	—
13	Pointer.	"	—	—	—	"	—	—	—
14	Setter	"	6 "	Scotland	3 "	"	6	None	Canker and tape-worm.
15	Newfoundland	"	—	—	—	"	6	One	—
16	Bull-terrier	"	—	China	—	Fair	9	None	Fits on exercising.
17	Spaniel	"	5 yrs.	England	¾ yr.	Good	5	"	—
18	"	"	5 "	"	"	"	1	Several	Many white corpuscles.
19	"	F.	5 "	"	6 "	Thin	6	None	—
20	Bull-terrier	"	6 "	Amoy	6 yrs.	Good	10	"	Fits on excitement.
21	English Terrier	M.	2 "	—	—	Very thin	2	Very abundant	Won't fatten.
22	Setter	"	5 "	—	5 yrs.	Good	3	None	Mangy.
23	Newfoundland and Collie.	"	5 "	Australia	5 "	"	1	One	Weak hind quarters.
24	English Terrier	"	—	—	—	"	1	"	—
25	Bull	"	10 yrs.	England	8 yrs.	Thin	Several	Abundant	Lost strength and pluck.
26	Chinese, large	"	—	—	—	Good	—	—	Killed.
27	"	"	—	—	—	—	Many	None	"
28	"	F.	—	—	—	Fair	"	"	"
29	Retriever	M.	4 ½ yrs.	China	4 ½ yrs.	Good	One	Three	—
30	Chinese, small	"	—	"	—	Thin	Several	Very abundant	Killed.
31	" large	"	Old	"	—	Good	"	None	"
32	" small	F.	"	"	—	Thin	Many	"	"
33	"	M.	—	"	—	Good	Several	"	"
34	" large	F.	—	"	—	Thin	"	"	"
35	"	"	—	"	—	Fair	"	Several	"
36	"	"	—	"	—	Good	"	None	"
37	"	"	—	"	—	"	"	Several	"
38	"	"	—	"	—	"	"	None	"
39	"	"	—	"	—	"	"	"	"
40	"	"	—	"	—	"	"	"	"

No selection was made of animals for examination.

ANALYSIS OF TABLE.

- (1.) Of 40 animals whose blood was examined, the embryos of *Filaria immitis* were found in 15.
- (2.) In 16 post-mortem examinations, *Filaria immitis* was found in the heart in 8.
- (3.) In 14 post-mortem examinations, *Filaria sanguinolenta*, or lesions produced by it, were found in 9.

POST-MORTEM EXAMINATIONS.

- | | |
|--|--|
| <p>No.
1. <i>Filaria immitis</i> in right ventricle.
25. Lungs tuberculous, pleuritic effusion; <i>F. immitis</i> numerous; <i>F. sanguinolenta</i> not looked for.
26. Four <i>F. immitis</i> in right heart and pulmonary artery.
27. Four unimpregnated female <i>filaria immitis</i> in heart; <i>F. sanguinolenta</i> in oesophagus; aorta sacculated.
28. No <i>filaria</i> in heart or oesophagus.
30. Forty-one <i>F. immitis</i> in heart. <i>F. sanguinolenta</i> in pleura and oesophagus.
31. No <i>filaria</i> in heart, aorta or oesophagus.
32. No <i>F. immitis</i>. Several tumours in aorta, one containing an immature <i>F. sanguinolenta</i>.</p> | <p>No.
33. No <i>F. immitis</i>. <i>F. sanguinolenta</i> in aorta and oesophagus.
34. No <i>filaria</i> in heart. One aortic tumour, oesophagus healthy.
35. Six <i>F. immitis</i> in heart. Several oesophageal tumours containing <i>F. sanguinolenta</i>. One aortic sacculum.
36. Normal.
37. Three or four <i>F. immitis</i> in heart. Aorta and oesophagus normal.
38. One large <i>filaria</i> tumour in aorta; otherwise normal.
39. Four small <i>filaria</i> tumours in aorta, with immature worms; otherwise normal.
40. One male <i>filaria immitis</i> in heart; several small tumours in aorta and mature <i>F. sanguinolenta</i> in large oesophageal tumour.</p> |
|--|--|

The embryo Filaria.—A glance at FIG. I. (2), will convey an idea of the immature hæmatozoon thus discovered, and may assist the observer to recognize it when met with. According to my measurements, it is about $\frac{1}{100}$ of an inch in length, by $\frac{1}{3000}$ of an inch in breadth, and as far as I can make out is quite structureless. On close examination with a high power, something like a mouth can be seen at the blunt extremity, which appears to be alternately protruded and retracted. (3, 4) The body attains its greatest diameter a short

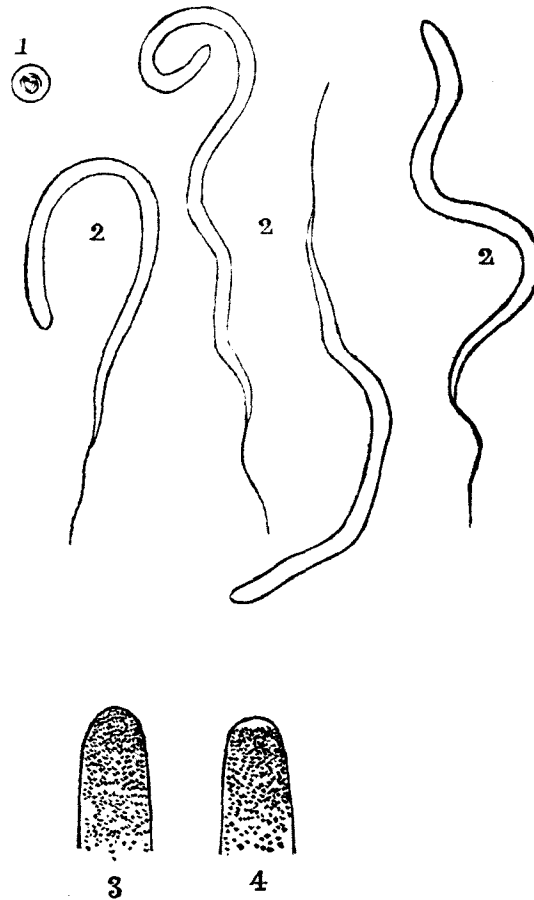


FIGURE I.—EMBRYO FILARIÆ IMMITES.

1. A blood corpuscle.
2. Free embryos.
3. Head of the latter more highly magnified.
4. The same, showing the appearance (described in the text) of retraction.

distance from this point, and maintains the same thickness for about two-thirds of its length; beyond this point, it gradually tapers off to the long and filiform tail. In freshly drawn blood the animalcule is in constant motion, wriggling about amongst the blood corpuscles with a snake-like movement, and lashing out most vigorously with its supple and slender tail. It never seems to be at rest, and retains its activity as long as the blood continues fluid, often for many hours. It never seems to attach itself to the blood corpuscles or to the surface of the slide. I have

never seen any sign of growth or development in the many specimens I have examined, the measurements and appearance of all being exactly alike.

Their great Number.—So numerous are these creatures in some specimens of blood that I have seen as many as five in full activity in one small field of the microscope. From this some idea may be formed of the vast numbers existing in the total circulation in such a case, and one cannot but wonder that it is possible for a dog, containing such a prodigious number of parasites, to live. I know many dogs thus infested, and who have probably been so for many years, yet they seem in no way inconvenienced by their guests, have attained a good old age, and are fat and well nourished.

The Mature Filaria, its Habitat.—If a dog whose blood is thus infested dies or is killed, the parents of these microscopic filariæ are found coiled up in the right ventricle of the heart for the most part, sometimes extending through the tricuspid valve into the auricle, and even into the superior vena cava, and very generally through the semilunar valves far into the pulmonary artery and its branches. I have never found them, or anything resembling them, in any other vessel, though careful search has been made in all the larger veins. In the heart, their bodies are found after death surrounded for the most part with a dark soft grumous clot, which, on microscopic examination, is found to be swarming with the embryos above described.

Numbers.—Their number varies very much. Sometimes there are only three or four, while in other instances the heart and pulmonary artery are actually stuffed with them, so that one can hardly understand how the circulation can possibly be carried on. The largest number I have counted was forty-one, and in this instance some were probably overlooked, as they extended into the smaller branches of the pulmonary artery, and escaped detection.

Naked eye Appearances.—On opening the heart, the worms are found massed together in a bundle like a coil of thick catgut that has been some time steeping in water. The few sluggish movements they exhibit, after the death of their host, form a striking contrast to the liveliness of their progeny. On unravelling and extending them, they can be separated into two kinds; one sort, the larger and plumper, measure from eight to thirteen inches in length by $\frac{1}{36}$ of an inch in diameter (FIG. II. 1, F.); the other, the smaller, five to seven inches in length by $\frac{1}{46}$ of an inch in diameter. (FIG. II. 1, M.) The former is the female, and is characterized by her superior dimensions and only slightly curved caudal extremity; the latter is the male, and is easily recognized by his fine tail curled up near its extremity, like a corkscrew or the tendril of a creeper. The colour of both is a milky opalescent white, with generally a long, and at places convoluted, thin red streak, most marked near the head, running nearly the whole length of the body—this is the alimentary canal. They feel like whipcord when rolled between the fingers, and can bear considerable strain without breaking. If the body of the female is snapped or cut across, three slender threads can be drawn from one of the severed ends—these are the alimentary canal and the two uterine tubes. On the male being similarly treated, only two threads are observed, the alimentary canal and the testicle.

Proportion of the Sexes.—As a rule, the females are more numerous than the males. In one instance I found four females but no male. The general proportion is about one male to two females. In the instance above mentioned, in which forty-one worms were found together, thirteen were males and twenty-eight females.

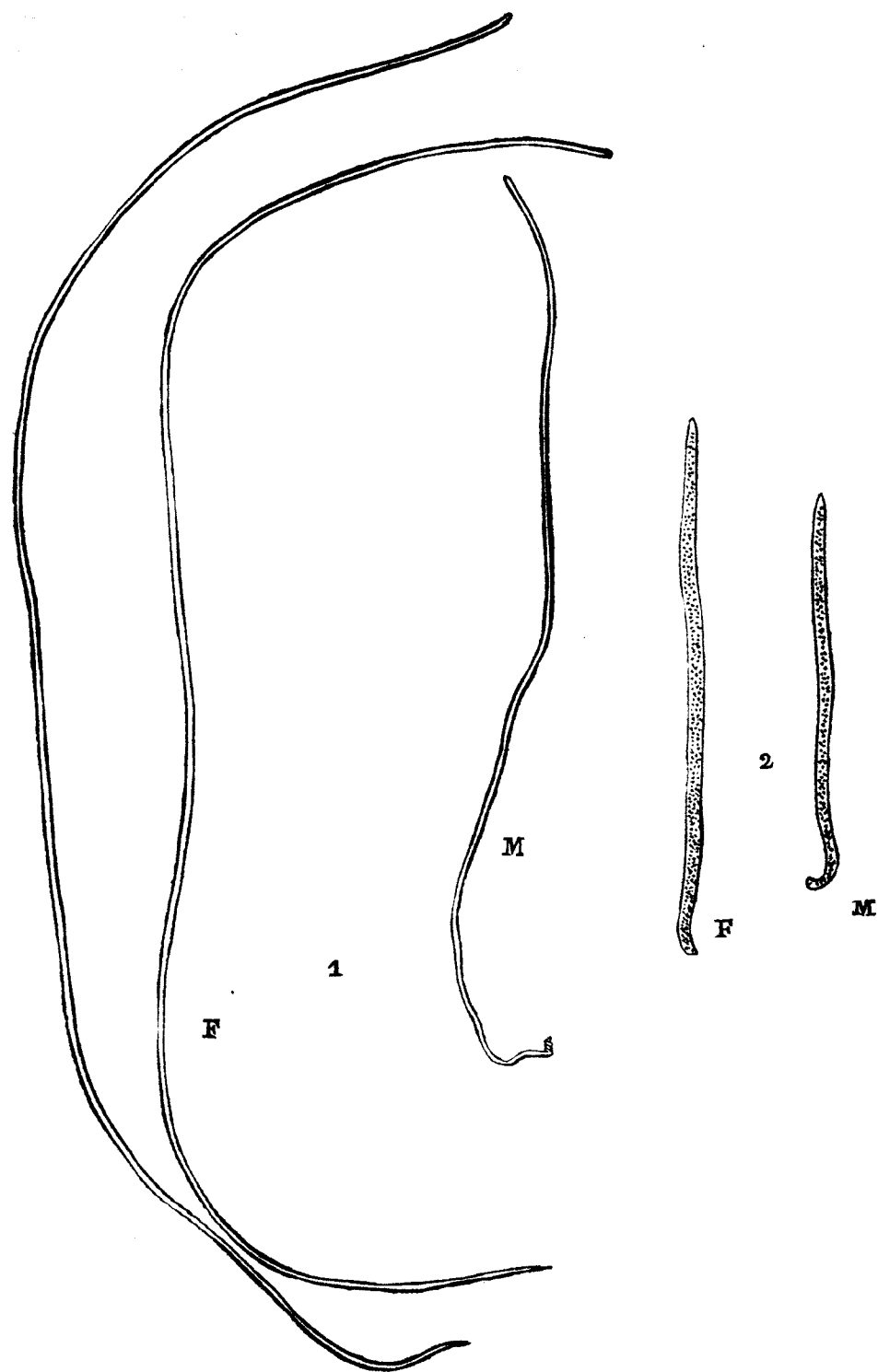


FIGURE II.—FILARIE IMMITIS AND SANGUINOLENTA.

1. *Filaria immitis*, natural size.—*F.*, female ; *M.*, male.

2. *Filaria sanguinolenta*, natural size.—*F.*, female ; *M.*, male.

Anatomy of the Mature Worm.—The Coverings appear to be two in number—the tegumentary, a very delicate diagonally striped membrane, continuous at the mouth and anus with the lining of the alimentary canal; and the fibro-muscular, or inner coat, of strong and coarse longitudinal fibres, strengthened about the head by numerous diagonal bands.

The *Alimentary Canal* commences by a funnel-shaped mouth (FIG. III., 1, 2) placed slightly to one side of the extreme end of the animal. This funnel-shaped opening contracting towards its apex leads to the pharynx and this to the œsophagus, which, running for a short distance directly backwards, terminates in a valvular-like opening in the intestine, about a quarter of an inch from the mouth. This, the main part of the alimentary canal, traverses the whole of the remaining length of the animal, to terminate in an anus placed not quite at the tip of the incurvated tail. For the most part, the course of this tube is straight, but at intervals it winds round the uterine or seminal tubes. It is rather narrower near the anus than elsewhere, but its dimensions seem to depend on the quantity of food, represented by a dark red granular matter, with which it is more or less filled. The œsophagus is usually empty and contracted.

The anatomy of the alimentary canal is about the same in both sexes.

Reproductive Organs of the Female.—The vagina opens at a point close to the union of the œsophagus and intestine. It is a narrow muscular tube, which, after a short and convoluted course, first forwards and then backwards, bifurcates. The two tubes thus formed gradually increase in diameter, and constitute the uterus. These two uterine tubes occupy the greater part of the animal, and extend from within half-an-inch of the head to an inch and a half of the tail. Their course is usually straight and parallel, but at intervals they are twisted round each other. Each terminates quite abruptly (FIG. III., 4) in a very delicate vessel, which after a short and nearly straight course, again gradually expands to about half the diameter of the uterine tubes, and after many turns, doublings and convolutions, ends, close to the tail, in the delicate ovarian tubes. The course of the latter is short and tortuous, and terminates abruptly as represented. (FIG. III., 3.)

Their Contents.—The contents of the female reproductive organs form a very beautiful and striking object for microscopic study, and from them, with a very little care, the whole history of the development of the embryo can be ascertained. To obtain specimens at different stages of development, it is only necessary to divide the body at short intervals with a sharp instrument, and examine the fluid which exudes from the severed ends. If a section is made near the tail, it is sometimes possible to draw or press out the very termination of the ovarian tubes, and after adding a little water, to observe the earliest appearances of the embryo. (FIG. IV., 1 to 7.) This is a globular transparent cell, from $\frac{1}{3000}$ to $\frac{1}{2000}$ of an inch in diameter, with a distinct nucleus and nucleolus. A little farther down the ovary, mixed with the clear globular cells, are others of a granular appearance and elongated form, measuring $\frac{7}{100}$ by $\frac{1}{2000}$ of an inch, with a nucleus and nucleolus dimly visible. Some of them are drawn out into a spine at one end or both, and when massed together, as they often are, resemble a columnar epithelium. Still farther down, the cells enlarge, the circular to $\frac{1}{1000}$, the spindle-shaped to $\frac{1}{500}$ by $\frac{1}{1500}$ of an inch, and are mixed with abundance of bright shining granules, measuring about $\frac{1}{8000}$ of an inch, resembling what is seen in the spermatic fluid of the male worm. About this point the nucleus is seen to be (FIG. IV., 6) divided, and as the examination advances into the uterine

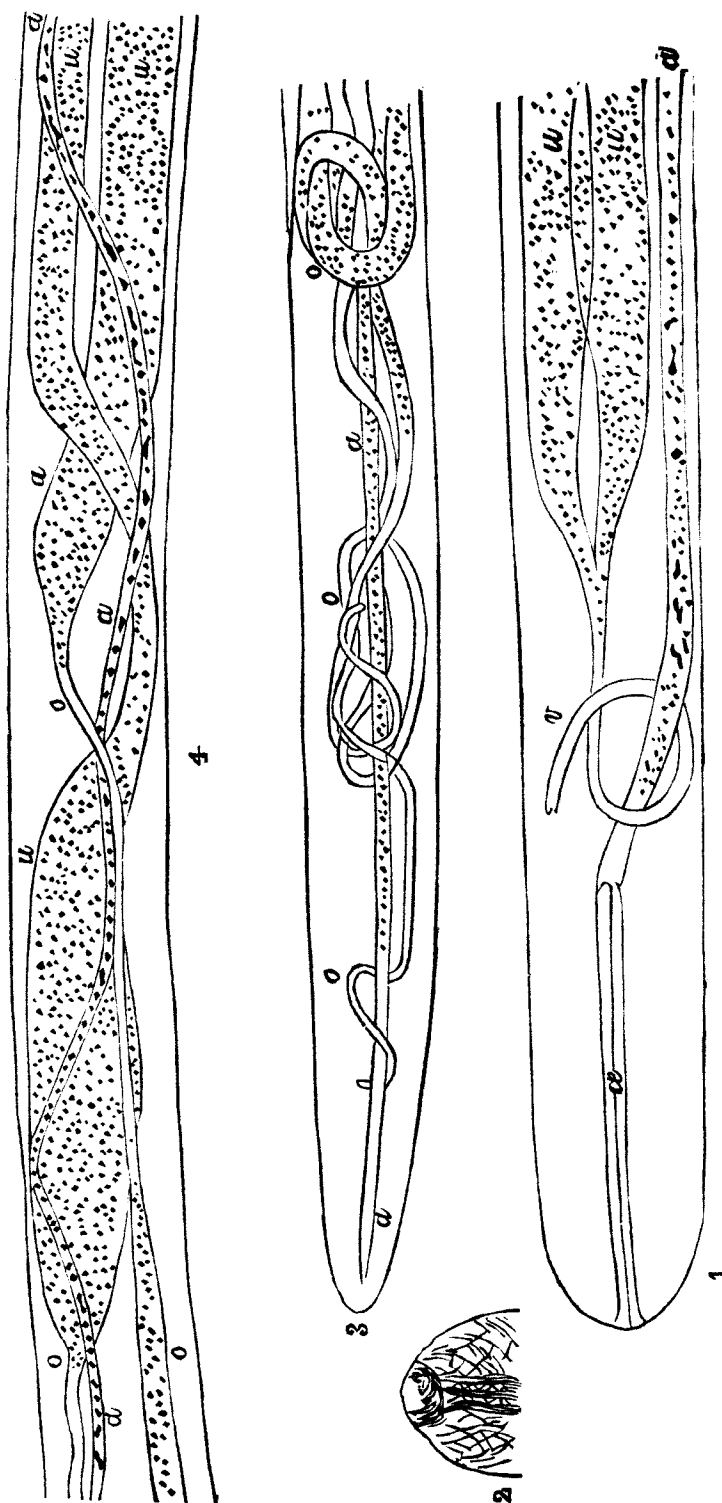
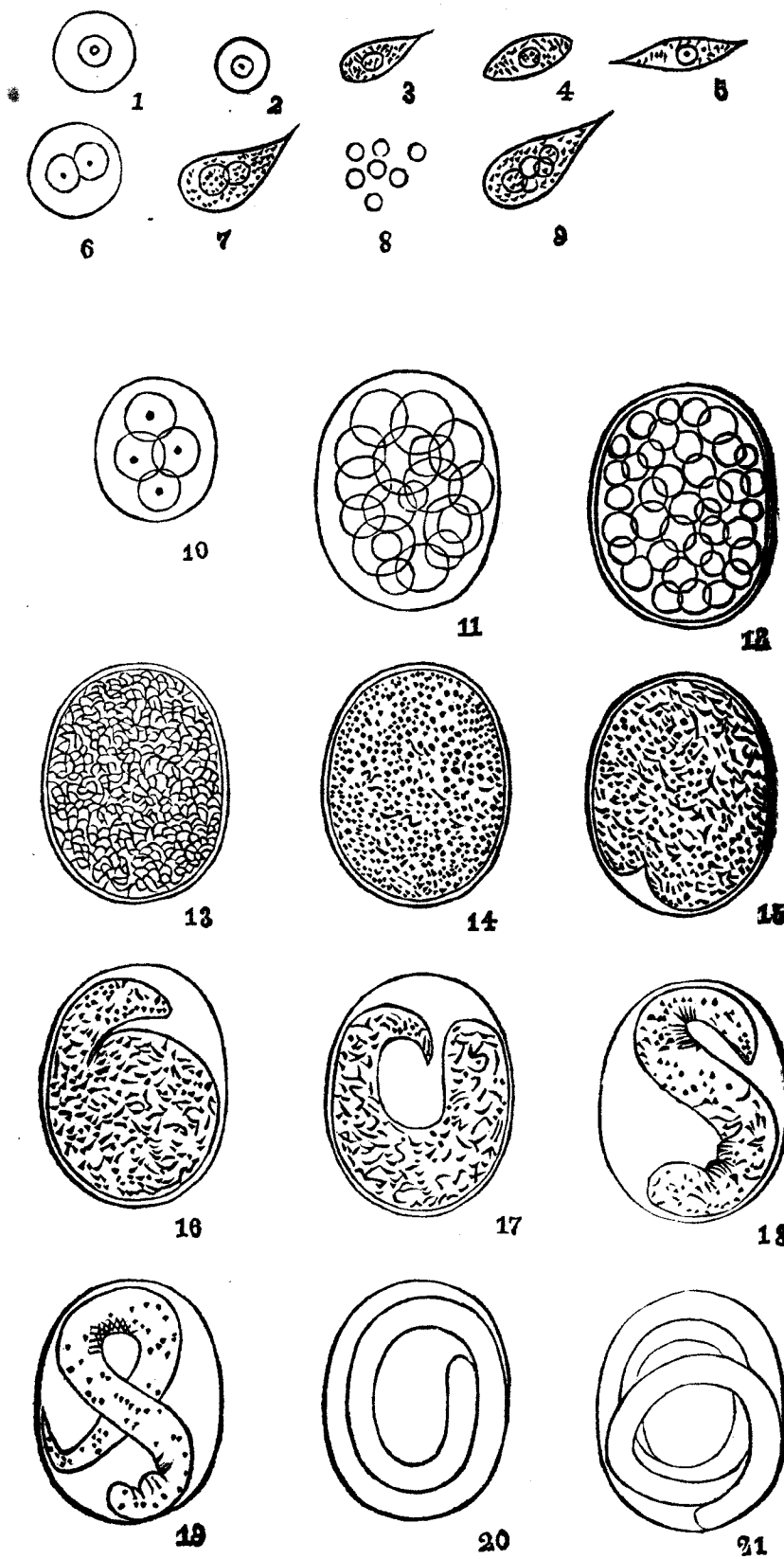


FIGURE III.—FILARIA IMMITIS.

1. *e.* Esophagus.
v. Vagina.
a. Intestine.
u. Uterine tubes.
2. The mouth.
3. *o.* Ovarian tubules.
a. Alimentary canal.
4. *u.* Uterine tubes.
a. Alimentary canal.
o. Ovarian tubules.

FIGURE IV.—DEVELOPMENT OF THE EMBRYO OF *FILARIA IMMITIS*.

tubes, division and subdivision of this nucleus proceeds, the cell increasing in size to $\frac{1}{760}$ by $\frac{1}{1000}$ of an inch, and acquiring the oval form which it maintains till (FIG. IV., 10, 11, 12) its maturity. By continued and minute subdivision of the nucleus, a mulberry mass is formed inside the envelope or shell. (13, 14.) An indentation is then observed at one point (15); this indentation deepens, and by degrees (16, 17, 18, 19, 20, 21) the semblance of the free embryo is shaped from the mass. When this process is perfected, the egg measures $\frac{1}{300}$ by $\frac{1}{800}$ of an inch. As its development advances, the embryo loses its granular appearance, and exhibits some amount of movement. Its movements gradually become more active, till towards the vaginal end of the uterus, the shell is burst, and shrivels up into an irregular granular membrane, and the embryo struggles out and swims about with all the vigour it afterwards displays when an independent organism in the blood. The liberated embryo measures from $\frac{1}{4000}$ to $\frac{1}{6000}$ in breadth by $\frac{1}{100}$ of an inch in length.

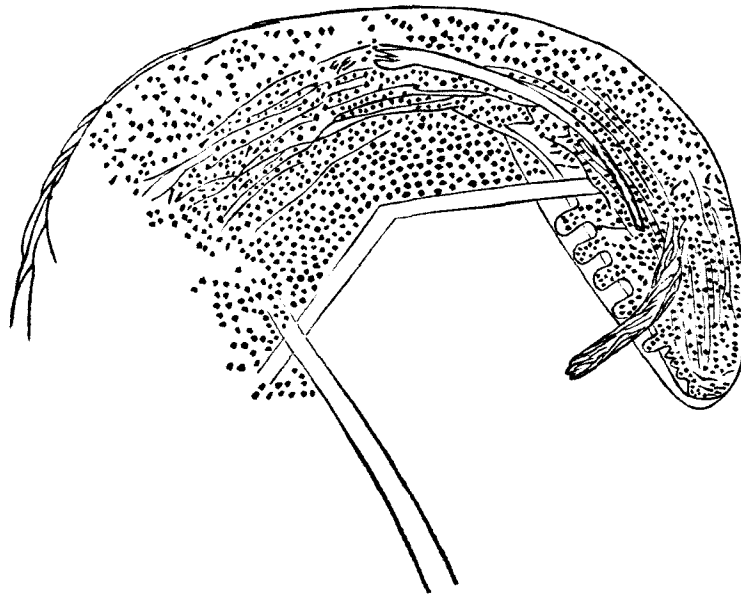


FIGURE V.—CAUDAL EXTREMITY OF *FILARIA IMMITIS* (male), showing spicules and papillæ.

Reproductive Organs of the Male.—Close to the extremity of the tail (FIG. V.) and on its under surface, are two very delicate spicules enclosed in a sheath and apparently retractile. Their common sheath is close to the anus. One spicule is longer than the other, being attached higher up the body. Besides these, there is a double row of delicate pedunculated papillæ, six on each side of the anus; and farther back than these, three minute serrations, and at the very extremity of the tail, two very small tubercles. I presume that these spicules, and perhaps papillæ, communicate with the testicle by means of a vas deferens, but this communication I have not been able to trace, owing to the thickness and opacity of the fibro-muscular coat of the tail in the male worm. The testicle is easily made out; it is a long, simple tube occupying the

greater part of the body; it terminates opposite the union of œsophagus and intestine, by the last few lines of it doubling back and gradually tapering down to a point. (FIG. VI.)

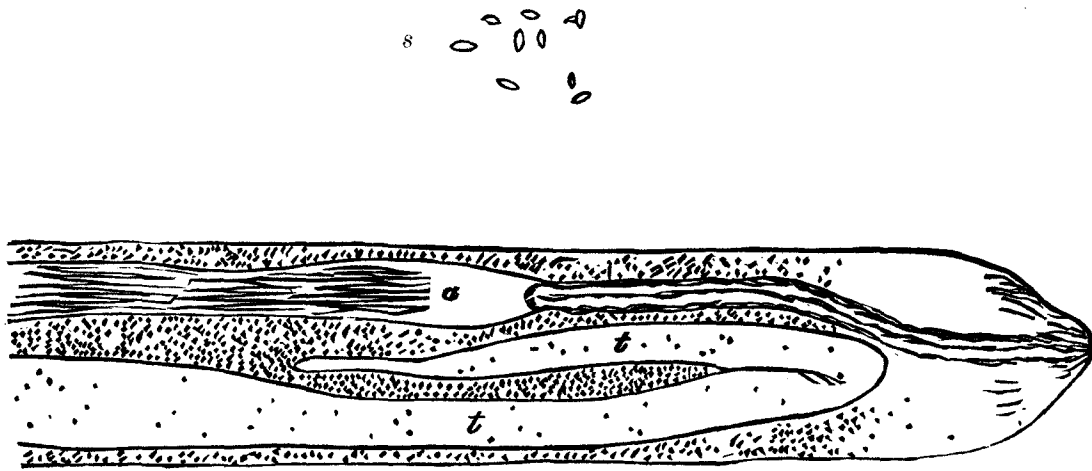


FIGURE VI.—ANTERIOR PORTION OF *FILARIA IMMITIS*, male.

- a. Alimentary canal.
- t. Testicles.
- s. Spermatozoa.

The Contents of the Spermatie Tube are represented by s.—They consist of a clear colourless fluid, in which minute shining elongated bodies are suspended. If the male is cut across near his caudal extremity, a drop of this fluid exudes. The spermatozoa measure about $\frac{1}{1000}$ of an inch in length.

How does Filaria immitis enter the Circulation?—We have seen the two extremes, so to speak, of the parasite's life; the minute structureless embryo, and the mature elaborately organized parent a foot in length. But I have met with no intermediate form; yet such there must be. Where to look for it I cannot suggest. I have searched in all the visceral and cervical veins, but without discovering a trace of such a form. Spleen, liver, kidneys, lungs, brain, all the viscera in fact, in every instance in which I have dissected them, have yielded no information. In his last report, Dr. JAMIESON suggests that the large water filariæ he had under observation for some time might be the heart-worm of the dog, but this is extremely unlikely, if not impossible. Of the two hundred or more species of filariæ known to naturalists, many live an independent life and never become parasitic. Such were probably the specimens he watched. They are found in abundance in stagnant water, moist earth, and in a variety of different media. Many, however, are parasitic in birds, fishes, quadrupeds and molluscs, free in the intestine or imbedded in different tissues. Such, as a rule, are swallowed with the food, having previously undergone some advance in development in the body of another animal, in water, in moist earth, or on vegetables which the final host consumes. The degree of development effected in these temporary media consists essentially in the elaboration of an alimentary canal, and a boring

apparatus wherewith to penetrate the tissues and assist the animal in its progress to its future resting-place. Now, in the case of the *Filaria immitis*, after a residence more or less prolonged in some suitable medium, it is swallowed, or in some other way obtains access to the tissues of the dog; then, by means of the boring apparatus with which it has become provided, it penetrates, and working its way to some spot in or near a vein, it rests for a time, loses all trace of its boring apparatus, and grows from probably a microscopic animal to a length of many inches, and becomes provided with a complete set of reproductive organs. This accomplished, it finds its way along the vein to its final resting-place, the right side of the heart, where the important function, reproduction of its species, is performed. I cannot tell whether the parasite ever dies before its host, or if it dies what becomes of it, or what effect its death has on the dog. In what animal or other medium the first step in development is gone through, I can only guess at, and what the spot or tissue it lies perdu in till it finally enters the circulation, I cannot find out. Both these points it would be interesting and important to ascertain. That the latter is not the heart I feel certain, as imperfect animals of a much smaller size and at different stages of development would be found there. Such I have never seen. The smallest female I have measured has been over seven inches in length, and all I have examined have been sexually mature. It cannot be in the arterial system, as to get at the right side of the heart the capillaries must be traversed; and it cannot be on the distal side of the portal circulation, as it would be arrested in the liver. The receptaculum chyli, thoracic duct, or the venous system, exclusive of that passing into the liver, must be the channel by which the heart is reached, and the places where the immature animal should be searched for.

Diseases produced by Filaria immitis.—One must be careful not to attribute to this cause the death of every dog in whose heart worms are found. We have seen that nearly two-thirds of all dogs are thus affected, and that for the most part host and parasite are apparently in good health. But I think there are at least two forms of disease fairly attributable to *Filaria immitis*.

The position the worm occupies in the circulation is about the safest so large and fertile an animal could select. Were the left side of the heart its habitat, the consequences to the host would surely be much more formidable; for in such case, the animal, escaping from the ventricle (as is its habit), would pass into some small but important artery, and all the evils of embolism would follow. Or even if the unhatched eggs were to escape in any number, as I suppose they sometimes do, there would be the same danger from capillary plugging in the brain, spinal cord, and elsewhere. The capillaries of the lungs, however, act as a filter, and all products of generation too large to pass capillaries,—all the results of death if such a thing occurs, and the wandering parasite itself should he, as he so frequently does, leave the heart,—all these are arrested there; the free embryo, of a diameter smaller than a blood corpuscle, too small to do harm by its size, alone passes through. As a consequence of this filtration, the lungs may themselves be injured, and I put down tubercle, or tuberculoid disease, as an occasional result of this process. I have met with an appearance closely resembling miliary tuberculosis in the lungs of filaria-stricken dogs, and in many cases where no distinct tubercular appearance exists, the lungs feel, when squeezed between the fingers, as if they contained numerous minute particles of gravel.

The most frequent and important effects, however, are those that may be attributed purely to the mechanical interference with the valves of the heart, and the capacity of the pulmonary artery and branches. But it is astonishing how very considerable the bulk of the bunch or rope of worms extending through the tricuspid and pulmonary valves may become. In many instances it must be impossible for the valves to close properly, or for more than one-third of the full stream of blood to be transmitted by the pulmonary artery. Such an animal must of course be short-winded, and perhaps liable to attacks of syncope, especially on exertion or excitement, when the demands on the circulation are greatest. And it is after some occurrence, such as a fight, that death most frequently occurs. Possibly, then, the energetic working of the ventricle has forced one or two more worms suddenly into the pulmonary artery, or entangled them among the valves or chordæ tendineæ, and death may come suddenly or only after a day or two, during which breathlessness and other signs of failing circulation point to the probable cause of illness.

A Hint to Sportsmen.—It is unlikely that a dog with many worms in its heart can be of much use in the field; his wind will go in the first half-hour of work. I would suggest, therefore, for the protection of the sportsman who contemplates buying a dog in China, that he should have its blood examined microscopically by a competent person, and if embryos of *Filaria immitis* are found in any quantity, that he should not make the purchase.

FILARIA SANGUINOLENTA.

I employ this name on the authority of Dr. LEWIS, who adopts it from SCHNEIDER. The latter applied it to a filaria found imbedded in the walls of the stomach of dogs, the description of which Dr. LEWIS says applies very closely to the animal found by him in the œsophagus, thoracic aorta and neighbouring parts of the pariah dogs of Calcutta. Dr. LEWIS's description nearly corresponds with what I have observed in Amoy, and I have no doubt the parasites are identical. In the following notes I will confine my remarks strictly to what I have myself observed.

Its Prevalence.—Some idea of the extent of this may be formed from the fact, that of thirteen dogs slaughtered for the purpose of procuring specimens of this parasite, nine contained the living animal in different stages of development, or showed traces of its former presence. So that I think I may safely say that all dogs who have attained any considerable age are or have been its host, though the degrees of infection and accompanying lesions vary from that of the most trivial description to those of the utmost gravity.

Can its Presence be recognized during Life?—Dr. LEWIS has always found it associated with free embryo filariæ in the blood, such as I have described as belonging to *Filaria immitis*, and he looks upon these embryos as the progeny of *Filaria sanguinolenta*. He is quite aware of the possibility of his being mistaken, but he thinks it unlikely, as in several instances in which *Filaria sanguinolenta* and embryo filariæ were present together, he pursued his search into all the principal blood-vessels for other forms of mature filariæ, such as might have given birth to the free embryos, but without finding any. Still, I think he is in error, and for the following reasons:—Embryo filariæ are found in the blood where there may be no aortic tumours; among the thirteen dogs just referred to, there were seven which, although contain-

ing *Filaria sanguinolenta* or exhibiting traces of their presence, yet had no free embryos of any sort in the blood, at least I did not find them; whereas, when *Filaria immitis* was present in the heart, free embryos were found in all but two cases. The two exceptions almost amount to a proof in themselves, for in one case *unimpregnated female* *Filaria immitis* were found without any male worm, and in the other a solitary male, while aortic sanguinolenta tumours were present, and breeding sanguinolenta females were found in the œsophagus. There are other reasons, which will appear by and by, why we should not consider the free embryos often associated with it as the progeny of *Filaria sanguinolenta*. I conclude, therefore, that beyond perhaps difficulty in swallowing, produced by the mechanical action of a *Filaria* tumour in the œsophagus, there is no reliable symptom by which *Filaria sanguinolenta* can be detected during life. If the fæces were carefully searched, and perhaps the urine also, eggs might be found, and constitute certain evidence.

The Habitat of Filaria sanguinolenta.—I have found specimens imbedded in characteristic tumours in the walls of the thoracic aorta, in the walls of the œsophagus, in the loose cellular tissue in front of the latter, and in the pleura; never elsewhere.

The Lesions it produces are very characteristic. On opening the thorax of an affected animal, and drawing the heart and left lung over towards the right side, the straight part of the thoracic aorta may be seen to be studded with small tumours, ranging in size from a small pea to a bean, and the anterior and lateral surfaces of the œsophagus bulged out by tumours perhaps as large as a walnut, and where several of these are in juxtaposition, a large lobulated tumour may conceal the œsophagus altogether. To the touch these tumours are hard, though at points there may be a feeling of deep fluctuation. If the aorta is excised and split open, its inner surface is found, at the points corresponding to the tumours on the outside, to be more or less deeply sacculated, the inner coat roughened, and the outer coats thickened. In the latter, worms at different stages of development (I have not found them very large in this situation) may be found, or perhaps the sacculation and external bulging may only be evidence that a worm had once been there, but has disappeared. When the worm has reached a certain stage in its development, a minute orifice can be seen on the inner surface of the tumour, communicating with the cavity containing the animal. Through this hole a purulent-looking fluid can be expressed; this, on microscopic examination, is found to be loaded with characteristic ova, and cells resembling those of ordinary pus. The tumours in the œsophagus occupy the muscular wall, and generally are much larger than those of the aorta. On the inner surface of the œsophagus a small hole is, as a rule, to be seen, perhaps several, communicating with the cavity of the tumour, and through this the purulent egg-laden fluid can be easily expressed; sometimes, and by no means rarely, part of the mature *filaria* protrudes through this hole and hangs loose in the channel. I have found connected with the œsophagus, mature tumours embedded as I have just described in the muscular walls, similar tumours cretified and enclosing fragments of a long dead *filaria*, small pedunculated tumours of filarian origin projecting into the channel, and long tunnels burrowing between the coats, in some part of which a parasite can be found. In addition to these, the more frequent situations, the animal may be found in large or small glandular-looking lumps in the areolar tissue of the posterior mediastinum, or encysted between the costal and pulmonary pleuræ. In all these situations I have found them, and all in the same dog. When

small, the parasite is found alone, closely invested by the peculiar tissue it seems to create around itself, lying as it were in a tunnel, but when mature, it is found loose in a larger tumour, in company with one or more (eighteen I found in one instance) all encapsuled in a common and perhaps cretified cyst, and floating in a purulent fluid.

Naked eye Appearances.—The mature female worm (FIG. II., page 17, 2. F.) measures from three to four inches in length, by about one-sixteenth of an inch in breadth; the male is shorter by an inch or more, and can be distinguished from the female by the simple incurvation at the tip of his tail. The colour in both sexes is a dark pinkish red. Rolled between the fingers, the body is found to be firm and hard, and when stretched yields, but does not rupture readily. The *Filaria sanguinolenta* exhibits similar movements to the *Filaria immitis* but they are more active.

Anatomy of the mature Filaria sanguinolenta.—The coverings are two, the integument, a delicate transversely-striped membrane, and the fibro-muscular, consisting, as in *Filaria immitis*, of strong coarse longitudinal fibres.

The Alimentary Canal extends the whole length of the body. The mouth is placed at the very extremity of the head, and is easily distinguished from that of *F. immitis*, by its six well marked lips. (FIG. VII., 4.) These lead to a narrow pharynx, which expands into a straight and capacious œsophagus, about one-third of an inch in length, which terminates in the intestine by a valvular arrangement similar to that in *F. immitis*. From this point the alimentary canal passes, in company with the uterine or spermatie tubes, in a tortuous course towards the anus, before reaching which it expands considerably, to contract again as it opens finally on the surface of the body, some little distance from the extremity of the tail. (5.) The walls of the alimentary canal are muscular, and are kept apart in places by a dark granular material, the food of the animal.

The Reproductive Organs of the Female resemble, in their arrangement, very closely those of *F. immitis*. The vagina opens near the junction of the œsophagus and intestine, and after a short convoluted course divides into the two uterine tubes. These expand, and running backwards and twisting round the alimentary canal at intervals, near the caudal extremity gradually taper down to the fine ovarian tubules. The latter do not expand again, as in *F. immitis*, but preserve the same calibre throughout their whole length, winding round the alimentary canal and each other in a very intricate pattern. (5.)

The Contents of the Female Reproductive Organs.—I have shown that the *F. immitis* is viviparous; the *F. sanguinolenta*, on the contrary, is oviparous. I have not studied the various stages in the development of the ovum, but, as observed in the purulent-looking fluid I have described as exuding from the mature filaria tumour, it is seen to be of a cylindrical form, the ends of the cylinder being rounded off. It measures about $\frac{1}{16}$ of an inch by $\frac{1}{16}$. (1.) The embryo is visible in most eggs, doubled up in the interior, and if a little pressure is applied to the covering slide, the shell can be burst and the animalcule expressed. (2, 3.) As thus observed, the embryo measures about $\frac{1}{16}$ of an inch in length, and resembles in form that of *F. immitis*, though rather more truncated at the caudal extremity and exhibiting no movement.

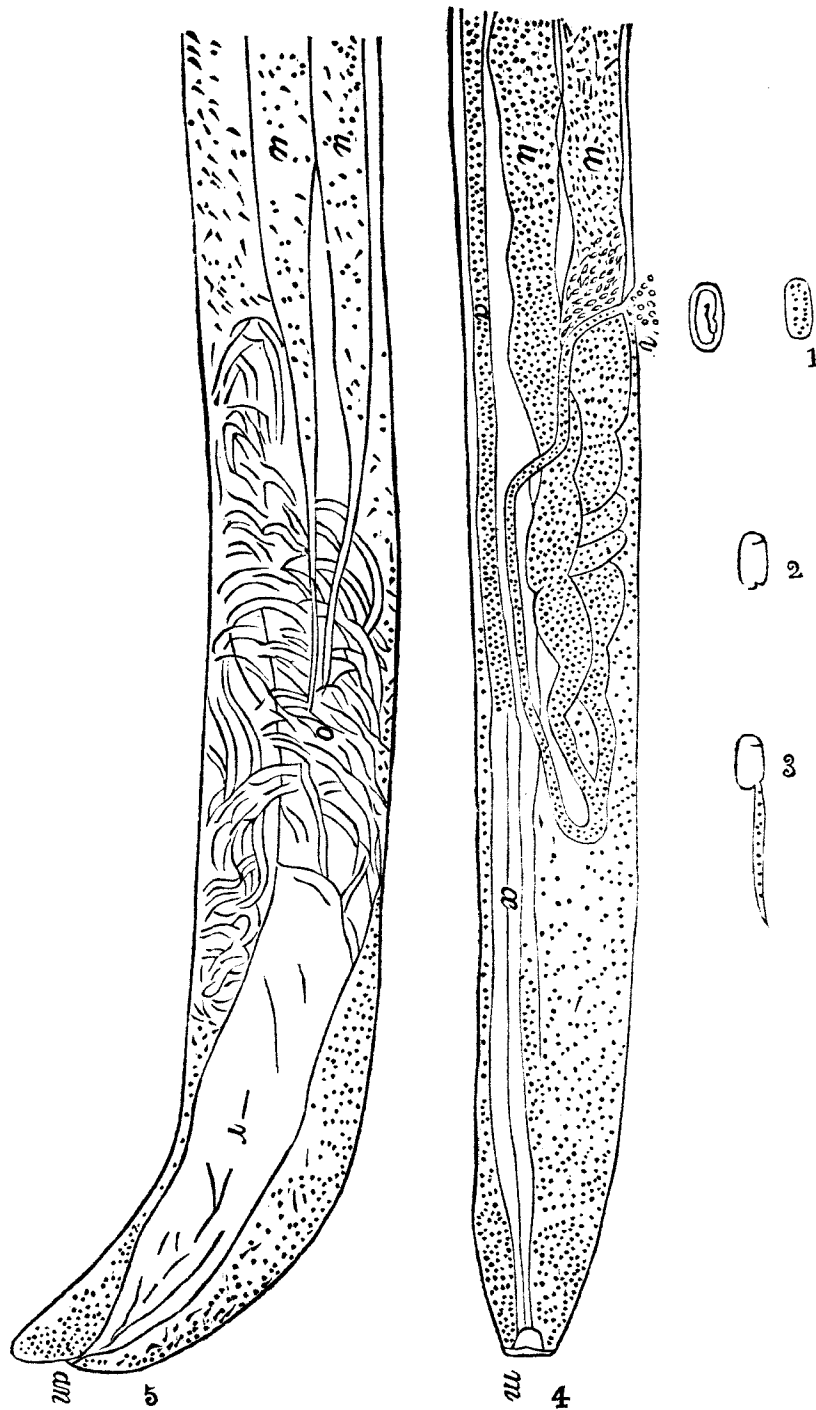


FIGURE VII.—FILARIA SANGUINOLENTA—Female.

- | | |
|---------------------------|---------------------------|
| 1. Ova. | v. Vagina; eggs escaping. |
| 2. Shell; embryo escaped. | u. Uterine tubes. |
| 3. Embryo escaping. | 5. Caudal end. |
| 4. Anterior end. | an. Anus. |
| m. Mouth with six lips. | r. Rectum. |
| a. Oesophagus. | o. Ovarian tubules. |
| a. Intestine. | u. Uterine tubes. |

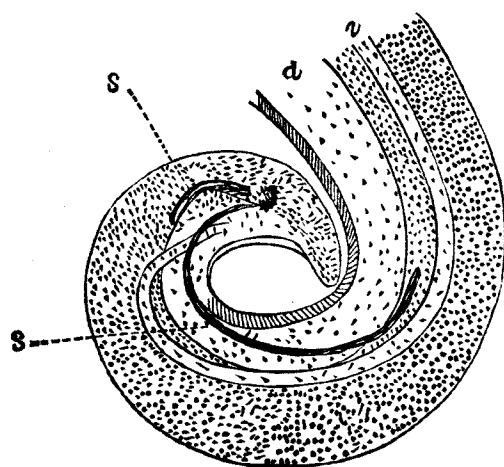


FIGURE VIII.—FILARIA SANGUINO-
LENTA—Male.

Caudal extremity.

a. Alimentary canal.

v. Vas deferens.

s.s. Spicules.

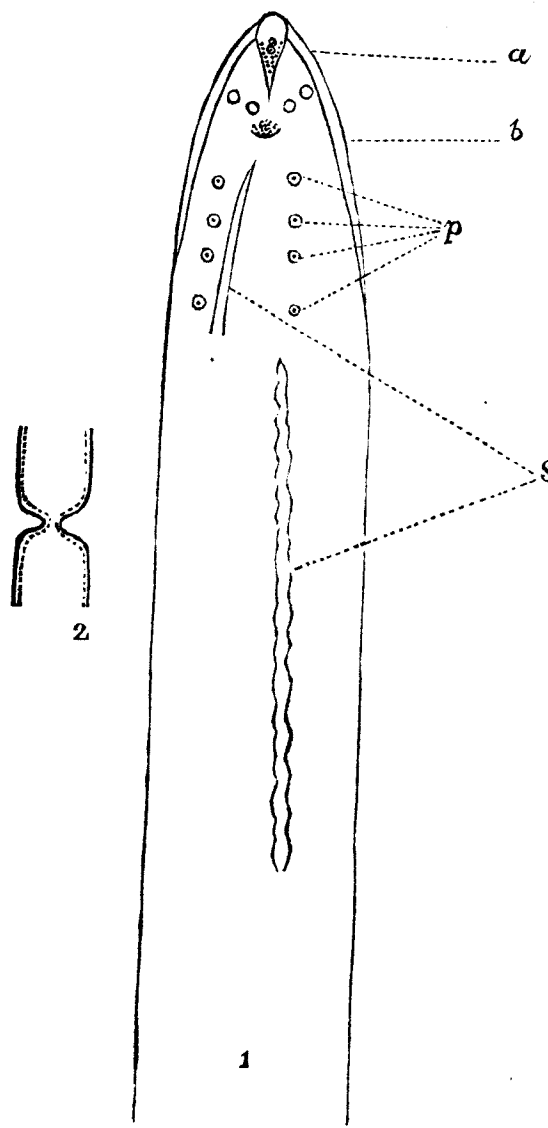


FIGURE IX.—FILARIA SANGUINOLENTA—Male.

1. Sketch plan of tail of male.

a. Leaf-shaped appearance at extremity.

b. Orifice of the sheath of spicules.

p. Papillæ.

s. Spicules.

2. Constriction between vas deferens and testicle.

Reproductive Organs of the Male.—If the under surface of the tail (FIGS. VIII. and IX.) is examined, two rows of papillæ are seen on each side of the orifice of the sheath of the spicules and the anus, four in front of them, arranged in two lines parallel to the long axis of the body, and two behind placed obliquely. Viewed laterally, these papillæ are seen to have long pedicles. At the very extremity of the under surface of the tail is a clear space shaped like a rose-leaf, and in the centre of this are two more, but very minute, papillæ. The penis is represented by two spicules, one very long, attached farther up the body than the other, the shorter. In the specimens I have examined, the spicules were retracted, but the delicate outline of a sheath could be traced to a common opening in front of the anus, through which they are, I suppose, protruded. The tendons of a retractor muscle can be seen attached to the deep end of each spicule. I could not make out the connection of the vas deferens with the spicules and papillæ, but doubtless it exists. Traced upwards, a point is reached where the vas deferens contracts very abruptly (FIG. IX., 2) and the testicle begins; this extends to near the junction of the intestine and œsophagus, where the tube becomes doubled on itself, very much as in *F. immitis*; only the doubling is much longer, extending backwards for nearly half the length of the testicle, and when carelessly viewed giving rise to the idea that the testicle, like the uterus, is double.

The spermatic fluid I have not examined.

The mode by which Filaria sanguinolenta obtains access to the Tissues is made sufficiently clear by an examination of the tissues it attacks. From its being found in and near the œsophagus, we are justified in inferring that the embryo is swallowed, that it attaches itself to the walls of this tube, pierces them, and buries itself in the muscular coat, where a fibrous covering is formed around it; or, perhaps its journey is continued a very little farther, and it enters the walls of the thoracic aorta, or the posterior mediastinum. From all of these situations I have extracted specimens, varying in length from a few lines, in the immature animal, to upwards of three inches in the pregnant female. Small worms are most frequently found in aortic tumours, and on this account I incline to think either that they do not often attain maturity there, or that they leave it for the more favourable situation of the œsophagus. Immature worms are single and lie closely invested in their tunnels; the mature are always in company, sometimes in considerable numbers, and float loose in a fluid enclosed in a cyst. I infer from this diversity of arrangement at these two stages in the animal's history, that when the sexual organs have arrived at a certain point of development, the parasite resumes its perambulations, seeking out one of the opposite sex. In this way many are brought together, as where once a track is formed, others, on coming across it, are likely to follow it. I have seen an œsophagus dissected in various directions by long tunnels, at the end of which I found a parasite. When the sexes come together the female becomes impregnated, a small aperture is formed in the cyst leading to the channel of the œsophagus or aorta, and through this ova are poured into the alimentary canal or circulation; the female, more certainly to accomplish this, sometimes protruding her tail through the hole.

Is there any connection between Filaria immitis and Filaria sanguinolenta?—Considering that both are very frequently found in the same dog and intimately connected with the circulation, some might be tempted to suggest that they are of the same species, in different stages of development. But a glance at the physical characters of each is sufficient to establish

the impossibility of this. I give below, arranged in the form of a table for the sake of the contrast, the principal points of difference.

—	FILARIA IMMITIS.	FILARIA SANGUINOLENTA.
	Viviparous; active embryo $\frac{1}{100}$ " in length.	Oviparous; motionless embryo $\frac{1}{200}$ " in length.
Length	Never under six inches	Never over four inches.
Colour	Milky white	Reddish pink.
Mouth	Simple	Six-lipped.
Male	Corkscrew-like tail; spermatic tube tapers gradually to testicle.	Tail, a simple incurvation; vas deferens ends abruptly by a constriction.
Female	Uterus contracted abruptly to form ovarian tubes, which again expand to gradually taper to short terminal tubules.	Uterus gradually tapers down to ovarian tubules, which are long and do not again expand.
Habitat	Venous system	Arterial system and alimentary canal.

Diseases produced by Filaria sanguinolenta.—I believe there are three serious morbid conditions produced by this parasite.

1.—Stricture of the Œsophagus, more or less complete. This most frequently occurs when several large tumours are formed, especially when they are grouped together near the cardiac end of the tube, the most frequent locality. Regurgitation of food and slow starvation will be the consequence, unless the tumours diminish in size by the escape of their contents or death of the filariæ.

2.—Pleurisy. This is not uncommon in dogs here, and I think is often caused by the bursting into the pleura of a tumour which does not find vent for its contents by opening in the usual way into the œsophagus or aorta. I have found very distinct evidence of this occurrence in one instance. In it, worms were found crawling about amongst recent adhesions in the serous cavity.

3.—Paralysis of the Hind Legs. This is also common here, and is, I believe, caused by plugging of the capillaries of the spinal cord by ova escaping into the aorta. The brain is not affected, as the filaria tumours are seldom if ever situated on the cardiac side of the arteries proceeding to the head. Other affections are doubtless produced by the ova in the intestine, kidneys, and other viscera, but I have no knowledge of them or information to offer on this very interesting and important point.

FILARIA SANGUINIS HOMINIS.

The part played by Nematode Worms in Human Pathology.—The extent and importance of this is becoming year by year more recognized. In a former paper (*C. M. R.* No. 10, pp. 1-12) I pointed out the probable connection of a filaria worm with chyluria and elephantoid disease. The intestinal oxyuris and lumbricus are well known, as are also the strongylus gigas, the guinea-worm, and the trichina spiralis. The hæmaturia of the Cape, Egypt and the Brazils, is now acknowledged as depending on a similar parasitic cause, and I doubt not that, in time, many strange and at present unaccountable diseases of ex-European countries will be found to have a similar pathology. In my last report (*C. M. R.* No. 12, p. 37), I described a peculiar and

very prevalent form of stricture of the cesophagus I meet with in Amoy. Would not such a tumour in man, as I have shown is produced by *filaria sanguinolenta* in the dog, account for all the symptoms of cesophageal obstruction that I therein described? Could such lesions as this *filaria* produces in the aorta of the dog give rise to aneurism were they to occur in man? The great frequency of aortic aneurism among Europeans in China, and the prevalence of *filaria* aortic disease in dogs in the same country, is a significant coincidence. Another of our domestic animals, besides the dog, is well known to be affected by a penetrating *filaria* in China; the worm in the eye of the horse, which most medical men in China have, I suppose, been called on to extract, is another member of the genus. Seeing then that both the dog and the horse, man's most frequent companions, suffer from the presence of *filaria*, is it improbable that man himself should be the victim of a similar intruder?

These are some of the conjectures which this study in what I might term comparative pathology has thrust on me, and I cannot but regret that native prejudice forbids their being put to the test of post-mortem dissection.

Confirmation of the conjecture that Elephantiasis Arabum is a Parasitic Disease.—I have lately found in the blood of a patient who came to me for the removal of an elephantiasis scroti, numerous specimens of embryo *filaria*. I am thus enabled to state positively that elephantiasis Arabum is a parasitic disease, and to establish on solid and incontrovertible grounds, what in a former report I conjectured was the true pathology of this puzzling affection. Much, of course, remains to be done in working out the details of the exact operation of the cause, but the cue having been given, these will follow in time. A substantial basis, at any rate, is laid, to guide us in searching for means to prevent and cure a hideous and often fatal disease, afflicting a large proportion of the inhabitants of tropical and subtropical countries.

Since what precedes was written I have met with the *filaria sanguinis hominis* in the human blood no less than fifteen times.

With the practice I had acquired in the detection of hæmatozoa in the blood of the dog, I commenced some time ago the systematic examination of human blood. To help me in the work, which is excessively tedious and laborious, I familiarised two Chinese assistants with the appearance of the canine hæmatozoon, and showed them how to manipulate for the detection of similar organisms in man. No selection is made of cases, but the first patient or healthy person who presents and is willing to have his finger pricked, is examined; six slides of blood, at least, being carefully searched. In this way we have got over 190 cases, with the rather unexpected result of finding hæmatozoa in 15 instances, or in about 8 per cent. To prevent mistakes or imposition, when the parasite is found by my assistants, I take care to verify the observation for myself from a fresh specimen of blood, which I see drawn. I failed to find hæmatozoa in four instances in which they were reported, but I believe my assistants' observations were correct; they were confirmed by the persons who supplied the blood. Their horror at the snake-like animal they had given birth to was conclusive. As my re-examination was made some days after

the first detection of the parasites, it is likely that these had disappeared temporarily. This has happened in several instances I have myself closely watched.

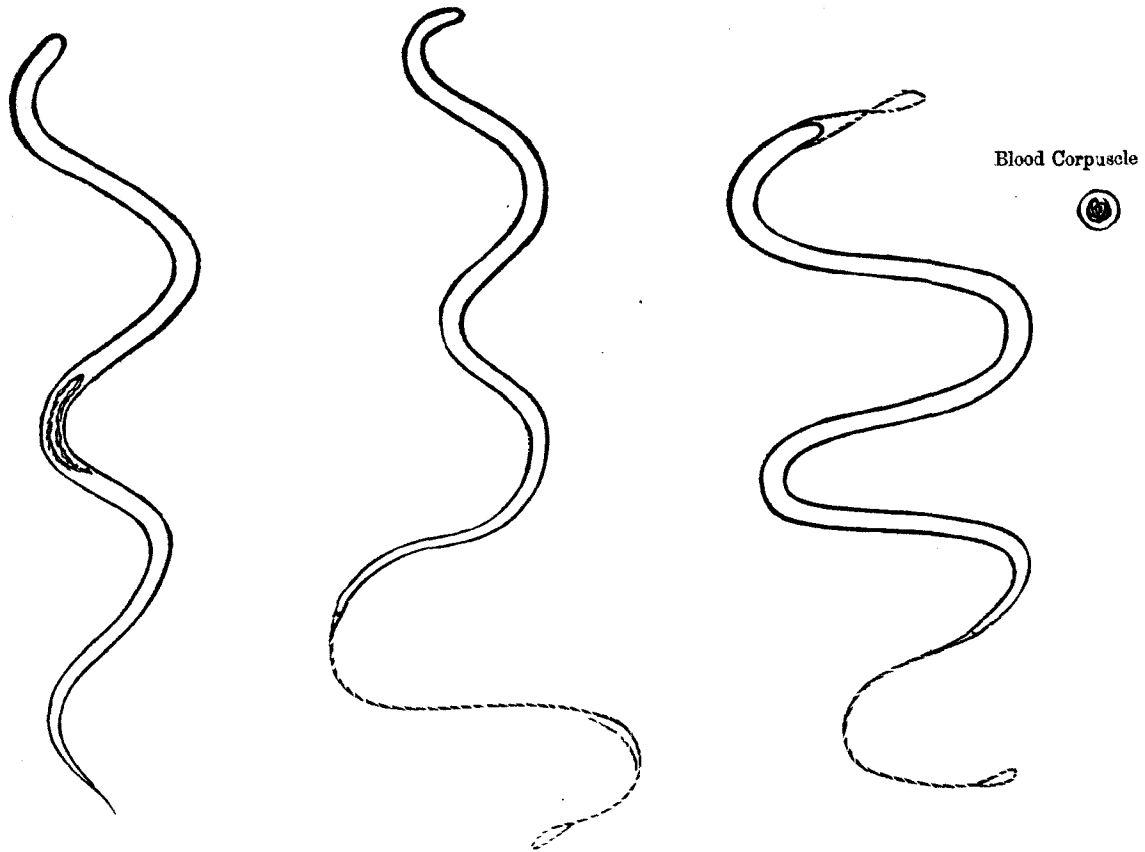


FIGURE X.—FILARIA SANGUINIS HOMINIS.

The *filaria sanguinis hominis* resembles very closely in general appearance and movements the canine hæmatozoon described above. Accurate measurements are difficult to make on account of the restlessness of the animal when alive and the contraction which its body undergoes when fixed in desiccated blood. The short time when the blood is thickening, previous to thorough inspissation, is the most favourable for examining the animal; then, its movements are languid and admit of details being studied. From a number of observations, I conclude that it measures slightly less than $\frac{1}{3000}$ of an inch in breadth, by about $\frac{1}{90}$ of an inch in length, or thereabouts; on the whole its dimensions are rather under those of the canine variety. There are two or three points in which distinct and characteristic differences can be made out in the two species, when seen through a high power. The canine variety appears to be naked and structureless; the human, on the contrary, is provided with a very delicate noncontractile integument, within which the body of the animal is incessantly shortened and elongated. (See

FIG. X.) This, I believe, is the explanation of the appearance of a lash of extreme tenuity at the head and tail being sometimes visible, and sometimes not, and the occasional thickening of the extremity of the tail. The lash is the collapsed integument from which the head or tail has been withdrawn, and into which they are again projected. It seems to have no elasticity or spring, but follows like a limp string the movements of the body of the animal. Unlike the canine hæmatozoon, in many specimens of the human variety, though not in all, there is about the centre of the body an elongated yellow patch, the structure of which with the microscopic power at my command I cannot make out. I believe it appertains to an alimentary canal. On close examination with a high power, distinct movements as of a mouth can be made out at the extremity of the head. They resemble the breathing movements of a fish's mouth. The aperture, if aperture exists, is not simple, but, I think, is provided with several lips.

In a future report I hope to give details of all the cases I have examined for hæmatozoa; at present I will confine myself to short notes of the cases only in which they were found.

Case 1. *Hæmatozoa and Elephantiasis Scroti*.—ANGKHI, male, æt. 58; from Changchiu, Liauhosia; cake baker; in comfortable circumstances. Father died long ago, he does not know of what disease; mother died from fever and dysentery; two brothers are alive and well, one brother died from fever and dysentery. He states that when 28 years of age, in the spring of the year, he had an attack of what he calls ague, accompanied by inflammation of the scrotum; the fever lasted for but one day, but it was two months before the scrotum recovered its original size; before doing so it desquamated. Since that time he has had attacks of fever every year from four to eight times, each attack being accompanied by inflammation of the scrotum. Two years ago the scrotum did not as formerly recover after the fever, but remained swollen, and has grown steadily ever since. Formerly he was strong and stout, but for the last ten years he has lost flesh. Has never had chyluria.

His scrotum presents the usual appearance of elephantiasis. I suppose it to weigh about eight pounds. On its under surface there is a solitary vesicle about the size of a split pea, and near this a bunch of dilated lymphatics: pricking these places gives vent to a drachm or two of coagulable milky lymph.

Blood from his finger or scrotum contained numerous specimens of *filaria sanguinis hominis*; nearly every slide contained one or two. On the second day of his stay in hospital, *filariæ* could easily be found, though they had manifestly diminished in number. On the third day, though thirty slides were examined, not one specimen could be obtained, and during the five subsequent days, though frequent examinations were made, there was no reappearance of *filariæ*.

I was anxious to keep this man under observation for some time before operating on his scrotum, but the frequent examination of his blood seems to have alarmed his friends, and he was in consequence removed from the hospital unrelieved.

Case 2. *Hæmatozoa without concomitant disease*.—SIN-TO, male, æt. 21; born in Tintai; came to Amoy about five years ago and became a pupil in the English Presbyterian Mission school. Does not remember to have suffered from any particular disease, except an attack of jaundice about four years ago, succeeding a smart fever (calls it ague) of one day's duration: his urine continued dark for about a month. He says he has been short-sighted ever since the jaundice. Never had abscess, boils, enlarged glands or anything resembling elephantiasis, lymph scrotum or chyluria, but has always been strong and healthy.

Being at the hospital one day, not as a patient, he saw a student examining the blood of a sick man; out of curiosity he submitted his own for examination. In six slides three *filariæ* were found in full activity. A week afterwards I found them in nearly every slide. A fortnight afterwards, I searched six full slides very carefully, but could find none.

Case 3. *Hæmatozoa and Lymph scrotum*.—SIAH, male, æt. 45; a field labourer, lives in Lamoa, Choanchia. This man is intellectually very dull and his memory appears to be very imperfect, so that

a reliable account of his early history is difficult to obtain. One fact he dwells on with great obstinacy, perpetually recurring to it during his examination; viz., that for twelve years he has suffered from feelings of discomfort and pain in his bowels, grinding of his teeth at night, and frequent seminal discharges. When 16 years of age, and again at 28, he had attacks of fever. Three years ago he had frequent fits of what he calls ague, the fever never continuing for more than one day at a time, but recurring every week or two. But before this occurred he noticed that his scrotum was itchy and covered with vesicles, which, when broken, would exude fluid in great abundance for seven or eight days. The scrotum and inguinal glands gradually enlarged, but it was not until they had attained considerable size that he became liable to fever. Last year he had a course of quinine at the hospital; since then he has had only one attack of fever, four months ago, and of three days' duration, and his scrotum he says has diminished very much. During the attack of fever, he says that the scrotum was not affected, but that the glands were inflamed.

The scrotum is not very large, but it is a characteristic "lymph scrotum." The left inguinal glands are slightly swollen; the right inguinal and right upper femoral glands are very much enlarged, feel soft and doughy to the touch, and are evidently varicose.

During a residence of about a week in hospital, this man's blood was daily examined, and on no occasion were filariæ absent, varying in number from two to five in six slides.

Case 4. *Hæmatozoa without concomitant disease*.—KIM, a large-footed married woman, æt. 33, from Changchiu; came to hospital for ulcerated cornea and pannus of five years' duration. Her general health is good, though she has leucorrhæa, and at times aguish feelings. She is liable to swelling (œdema?) of the arms and legs. She has enlarged inguinal glands on the left side; these appeared about the time she came to hospital; they were painless, and have been considerably diminished by rubbing them. She says she is dyspeptic and at times breathless. Never had chyluria.

Filarie are abundant in this woman's blood. Fourteen specimens were seen in six slides; they were found daily for a week.

Case 5. *Hæmatozoa, Fever, Enlarged Glands (and Chyluria?)*.—SIA, male, æt. 22; native of Hooihoah; farm servant and coolie. His father has elephantiasis of the leg, and enlarged glands. When seven years of age he remembers to have had an attack of fever and inflammation of the glands. For the last four or five years has had frequent attacks of a fever like quotidian ague, each attack lasting for three or four days, and being accompanied by swelling of the inguinal glands. At present these glands are but slightly enlarged; the skin of the scrotum, however, is *perhaps* slightly hypertrophied. He says that when he has fever his feet become red and swollen. In the fifth month of last year he once passed chylous urine: this is his statement.

On examining his blood six slides were found to contain three hæmatozoa.

Case 6. *Hæmatozoa and Elephantiasis Scroti*.—Tso, male, æt. 50; native of Hooihoah; has been a chair coolie in Amoy for twelve years. For the last fifteen or twenty years has been subject every fortnight or three weeks to attacks of shivering, heat and sweating, each attack lasting only for two or three hours, and followed by lassitude and anorexia, incapacitating him for work for the day. These attacks are preceded and accompanied by aching about the right knee, and swelling of the inguinal glands, especially on the right side. No swelling at these times of the scrotum. Otherwise is quite well. Never had chyluria.

The right inguinal glands are enlarged, and the skin of the scrotum slightly but distinctly hypertrophied.

Filarie were found in every second or third slide of blood. A week after the first examination, filariæ were again detected, but after another week in seven slides none could be found; that morning he had had one of his usual feverish attacks.

Case 7. *Hæmatozoa, Fever and Anasarca*.—LIENGGOO, male, æt. 34; native of and resident in Amoy; formerly a preacher and teacher, at present unemployed.

Until he was 29 years old never had any serious illness: that year he noticed a swelling of his legs. At 30 he had general dropsy for a month. At 31 had severe fever accompanied by delirium, and when the

fever left him he was dropsical and had a yellow complexion. After this attack he suffered from fever every month; he says he could tell the approach of the fever by observing that his body swelled, while his urine became scanty; fever was not preceded by rigor; when the fever subsided urine increased in quantity and the dropsy disappeared. These attacks always occurred at the end of the Chinese month, and would last from three days to a week at a time. During his thirty-second year, though his body was slightly dropsical, he had no fever. In the ninth month of his thirty-third year, he was weak and breathless; during the eleventh month his body again swelled, and he had attacks of fever more violent than before. Two months ago he had a very severe attack, accompanied by high delirium. I saw him at this time; he lay quite insensible in high fever, and his body was very much swollen; bedsores had formed over his sacrum. Under treatment by quinine, digitalis and nitre he recovered, the fever and dropsy subsiding and the sores healing. During the whole time he has been subject to these attacks, his appetite, even during the fever, has continued good. His friends say he is liable to maniacal attacks; his style of conversation and manner are certainly peculiar.

Heart and urine normal. Skin is yellow, flabby and coarse grained. Scrotum and inguinal glands partake of the general dropsy, but appear otherwise to be healthy. His blood contains filariæ in great abundance.

Case 8. *Hæmatozoa; no concomitant disease.*—KIM, female, æt. 23; Amoy; unmarried. Three years ago had a fever, supposed to be typhoid. Previous to this she was suspected of being phthisical, but since the fever, cough and all other symptoms of lung disease have disappeared.

Has never had chyluria or any affection of the lymphatic glands or integuments, and is apparently in good health.

This girl is the sister of the principal assistant in the Chinese hospital. Out of curiosity she got her brother to examine her blood, and in the first slide inspected three filariæ were found. The girl was shown the worms, and was so much alarmed by their appearance that she refused for a long time to allow any further examination. A few days ago I was allowed to examine her blood, and, although seven slides were carefully searched, no filariæ could be found. The specimens yielded by the previous examination I myself saw, so that there can be no doubt of the truth of her brother's statement. It may be worth while to mention that the day before the last inspection she suffered from slight feverishness.

Case 9. *Hæmatozoa and Lymph Scrotum.*—TOON, male, æt. 60; native of Lamoa, Toa Rhæ; a chair coolie; has lived in Amoy for eleven years.

Between 20 and 25 he became subject to attacks of fever and inflammation of the scrotum, coming on at irregular intervals of from a month to a year. These attacks have recurred more or less frequently ever since; sometimes, however, he has been free from them for a year or two. This year the fever is much less severe but it comes more frequently than formerly, the intervals between the attacks being only from four to six days. The fever resembles an ague very closely in its distinct division into cold, hot and sweating stages; but, unlike an ague, there is no regularity to be observed in the time of its accession, sometimes coming on at night, sometimes during the day, and not recurring at regular quotidian, tertian or quartan intervals. Each attack lasts about five hours, and is accompanied by slight swelling of the scrotum.

Never had abscess of scrotum, or chyluria. Two nights previous to examination he had one of the usual fever fits.

The scrotum is considerably enlarged, and varicose lymphatics on its surface yield a milky lymph on being pricked.

His blood contains abundance of hæmatozoa; one slide had as many as five specimens in full activity.

Case 10. *Hæmatozoa in a Leper.*—NIX, male, æt. 26; Lamcheng; shopkeeper; a leper for two years. I have no extended notes of this case, nor did I see hæmatozoa in his blood myself, though I searched many slides. My assistant, however, says that in the first slide he examined he found one, and his statement is confirmed by others.

Case 11. *Hæmatozoa with debility*.—BENG, male, æt. 22; Petsuia; a student in the Chinese Hospital.

As in the foregoing case, only one worm was found, which I did not see although many slides were subsequently examined. This lad suffers from debility, and though young has very bad teeth, bad complexion, has at times feverish attacks accompanied by feelings of languor. Has no swollen glands, or any appearance of elephantiasis, and has never passed chylous urine.

Case 12. *Hæmatozoa, Enlarged Inguinal Glands, Thickened Scrotum, Leprosy and Fistula in ano*.—BOO KIONG, male, æt. 38; Chinpo; farm servant; came to hospital to be operated on for fistula in ano.

Over his right malar bone is a patch of thickened skin, two inches in diameter, of a reddish colour and insensible to the touch. (Leprosy?) A near relation is leprous. No similar spots on any other part of the body. Was twice working in the Straits Settlements, five years at a time, and while there had ague; occasionally now has aguish feelings, and two years ago had an attack of fever, during which his scrotum became swollen and inflamed. At present the scrotum is slightly thickened, and on both sides the inguinal glands are enlarged.

My assistant found two filariæ in six slides. Next day I failed to find any, although a similar number of slides were examined.

Case 13. *Hæmatozoa; no concomitant disease*.—SIN, male, æt. 27; Oahai; shopkeeper; in good health.

When 16 years of age had an attack of ague during eleven days; has been much troubled with lumbrici, otherwise quite well. Inguinal glands readily enlarge when he has any irritation about his feet or legs, never otherwise. Is not subject to feverish attacks, never had chyluria; scrotum and glands normal.

An assistant found one hæmatozoon in four slides; he examined twelve more and I seven, but not another specimen could be found.

Case 14. *Hæmatozoa; no concomitant disease*.—AN, male, æt. 28; from Oahai; a cooper.

Had ague when 16 or 17 years of age for four or five days; three years ago had an eruption on his legs and face; he describes the spots as being red, slightly itchy, and each about the size of a cash; it kept out for about a month. With these exceptions, has always had excellent health. Never had chyluria or enlargement of scrotum, legs or glands.

In six slides examined by an assistant, thirteen filariæ were counted. Next day the same assistant searched seventeen slides in order to show me a specimen, but without success. I pricked the lobule of the ear, and from blood thus obtained placed a full drop between two slides; in this I found one solitary specimen.

Case 15. *Hæmatozoa; Enlarged Glands and Abscess*.—LENG, male, æt. 30; Lamo; a cobbler. Came to hospital on account of an abscess over the insertion of the right deltoid. I regret I cannot give this man's early history. His inguinal glands were enormously swollen and varicose, so much so that he was attempting to disperse the swelling on one side by the application of a native plaster. The scrotum was not affected.

There were no hæmatozoa in the first six slides examined, but the conviction I entertained on account of the characteristic appearance of the inguinal glands was justified two days afterwards, when on opening the abscess, many filariæ were found in the blood from the wound.

From these observations I think the following deductions are justifiable:—

1. That a large ratio of the population of this province, and probably of other parts of China, is infested with the *Filaria sanguinis hominis*. The exact ratio cannot yet be stated, but if my observations are a fair guide, one in thirteen is near it.

2. That the *Filaria sanguinis hominis* may be present in the blood, and yet the host be in good health, and exhibit no other morbid phenomena.

3. That in the same person it may be present at one time and absent at another.

4. That at one time or another it is very generally associated with elephantoid disease, and is almost certainly connected with the cause of such affections.

5. That it is sometimes associated with a diseased condition characterised by frequently recurring attacks of fever, accompanied by general anasarca unconnected with heart or kidney disease.

This last deduction I make from Case 7.—LIENGGOO. I have twice closely watched a similar train of phenomena, once in Formosa and once in Amoy. In both these instances, heart, lungs and urine were carefully and repeatedly examined, but nothing amiss with them could be detected. In one of the cases the anasarca, though general, was peculiarly distinct in the upper part of the body, suggesting pressure on the superior vena cava; but I could detect no aneurism or tumour of any sort to account for it. In both of these cases there was great prostration, weakness of the lower extremities, and, what I thought at the time an unjustifiably strong fear of death. Contrary to my prognosis, both died suddenly. I had come to consider that these were examples of beri-beri. After I became acquainted with *Filaria sanguinis hominis*, I speculated on the possibility of its having anything to do with them. When Case 7, LIENGGOO, presented himself, I made a shot at the diagnosis, and told my assistants he had worms in his blood. I was as much astonished as they were to find on examination that I was correct. This man is again ill with fever and anasarca.

I trust that others at the different ports will take up this enquiry as opportunity presents, and above all avail themselves of post-mortem examinations of Chinamen to search for the parents of the embryos found in the blood. Should I have an opportunity, I intend, before opening the abdomen, to follow up any dilated lymphatics I may find in the legs or scrotum, in the hope of encountering the cause of obstruction and probably the mature worm, in the glands, thoracic duct or their neighbourhood.

I would warn others against a hasty examination of the blood, and against concluding that, because no filariæ are found, none exist. For several years I have been in the habit of occasionally examining the discharge in lymph scrotum and the blood also, but until lately never encountered the *Filaria sanguinis hominis*. In fact, I kept a man for three or four years for the purpose of watching the progress of his lymph scrotum, and though I am convinced now that this man's blood contained filariæ, yet, on account of my examining probably only a small part of one slide and with a high power, I always missed them. At least six full slides should be examined, and every part of them carefully scrutinized. The power employed as a searcher should not be a high one, a quarter or half-inch is sufficient, but powers lower than these will do, provided they will distinctly define a blood corpuscle. If the light is too strong the very transparent body of the hæmatozoon is apt to be overlooked, at least it is not picked out so readily, and the eye of the observer becomes fatigued. If blood does not escape readily, or on slight pressure, from the prick in the finger or elsewhere, much force should not be used to express it, as the puncture is probably too small, and any filariæ the blood might contain will be hindered from escaping; a fresh puncture should be made. Another point the observer should attend to is, not to attempt to place too much blood under the covering glass; a small quantity should be scraped off the finger with the edge of the glass, and this placed with the charged part near the edge of the slide, and then slid along till the blood has almost reached the

circumference of the covering glass. This is an important point, as in nine instances out of ten the filariæ are found quite close to the edge of the patch of blood, and should this escape from below the covering glass, the chance of finding them is very small indeed. With attention to these details—which I again repeat are of the utmost importance to successful investigation—and with patience, I have no doubt that finds will be frequent, and I trust will be duly reported along with the failures.

E.—Dr. T. RENNIE's Report on the Health of Takow and Taiwan-fu, for the
Year ended 31st March, 1877.

DURING the past twelve months the health of this community has been better than usual. Towards the close of the summer six months there were three cases of simple intermittent fever, and during the winter six months only one case of climatic disease occurred. Beyond these, the only complaints treated were disorders arising from full diet and entire absence of exercise.

About the middle of November a priest belonging to the Spanish Roman Catholic Mission came from the country to be treated for dysentery of two months' standing. The patient was then very much emaciated, and after trying the most approved remedies with but slight success, he was ordered to the mainland, where, three months afterwards, he died. The disease was no doubt induced from an idea that the individual could best enjoy health on the smallest possible diet. So much afraid was he of plethora, that on two occasions he had himself bled. To his over-frugality the other members of the Mission attribute his malady.

Among the shipping the amount of sickness was much smaller than usual. One case of intermittent fever occurred in port.

Through the kindness of Mr. MANNERS, the Harbour Master, I am able to annex the following approximate record of temperature and rain-fall taken at Takow :—

DATE.	TEMPERATURE.			Number of days on which Rain fell.	DATE.	TEMPERATURE.			RAINFALL.
	Highest.	Lowest.	Average.			Highest.	Lowest.	Average.	
1876.	°	°	°		1876.	°	°	°	
April.....	87	69	74	...	October.....	85	68	78	1/10
May.....	87	72	80	...	November...	83	63	71	4/10
June.....	88	78	81	6	December ...	79	57	66	...
July.....	87	76	81	24	1877.				
August.....	88	75	80	18	January.....	79	58	64	...
September...	89	74	81	4	February....	80	46	66	3/10
					March.....	81	48	69	...

The temperature at Taiwan-fu is somewhat higher during summer and lower during the winter than at Takow.

The following is a list of the diseases of natives treated at the Takow Chinese Hospital during the past twelve months:—

A.—GENERAL DISEASES.

Intermittent Fever . . .	337 cases.
Remittent Fever . . .	202 „
Influenza . . .	11 „
Erysipelas . . .	3 „
Rheumatism, Acute . . .	8 „
„ Gonorrhœal . . .	2 „
„ Chronic . . .	56 „
„ Synovial . . .	2 „
Syphilis, Primary . . .	38 „
„ Secondary . . .	94 „
„ Hereditary . . .	3 „
Cancer . . .	6 „
Leprosy . . .	6 „
Scrofula . . .	4 „
Rickets . . .	1 „
Debility . . .	22 „
Anæmia . . .	93 „
General Dropsy . . .	32 „

B.—LOCAL DISEASES.

Diseases of the Nervous System:—

Meningitis . . .	1 cases.
Paralysis . . .	5 „
Locomotor Ataxia . . .	2 „
Hysteria . . .	5 „
Neuralgia . . .	2 „

Diseases of the Eye:—

Ophthalmia . . .	91 „
Gonorrhœal Ophthalmia . . .	14 „
Pterygium . . .	55 „
Keratitis . . .	2 „
Ulcer of Cornea . . .	75 „
Opacity of Cornea . . .	17 „
Staphyloma . . .	7 „
Iritis . . .	2 „
Impaired Vision . . .	6 „
Amaurosis . . .	4 „
Cataract . . .	10 „
Glaucoma . . .	2 „

Hordeolum . . .	6 cases.
Entropium . . .	18 „
Ectropium . . .	1 „
Trichiasis . . .	9 „
Tarsal Ophthalmia . . .	4 „

Diseases of the Ear:—

Otorrhœa . . .	6 „
Accumulation of Wax . . .	2 „
Polypus . . .	1 „

Diseases of the Nose:—

Sebaceous Cyst . . .	1 „
Ozæna . . .	4 „
Polypus Nasi . . .	2 „

Diseases of the Circulatory System:—

Pericarditis . . .	1 „
Dropsy . . .	2 „
Valve Disease . . .	2 „
Aneurism . . .	2 „

Diseases of the Absorbent System:—

Suppuration of Glands . . .	2 „
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Diseases of the Ductless Glands:—

Goitre . . .	4 „
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Diseases of the Respiratory System:—

Catarrh . . .	19 „
Laryngitis . . .	2 „
Chronic Bronchitis . . .	49 „
Asthma . . .	19 „
Pleurisy . . .	2 „
Pneumonia . . .	4 „
Phthisis . . .	42 „

Diseases of the Digestive System:—

Carious Teeth . . .	28 „
Necrosis of Lower Jaw . . .	1 „
Harelip . . .	1 „
Ulcerated Throat . . .	4 „
Ranula . . .	2 „
Dyspepsia . . .	36 „
Gastrodynia . . .	1 „
Dysentery . . .	9 „

Malæna	2 cases.
Hernia	2 "
Lumbrici	53 "
Diarrhœa	40 "
Constipation	22 "
Fistula in Ano	6 "
Hæmorrhoids	7 "
Fissure of Anus	1 "
Enlarged Liver	45 "
Cirrhosis	6 "
Icterus	6 "
Ague Cake	197 "
Ascites	29 "

Diseases of the Urinary System:—

Bright's Disease	2 "
Cystitis	4 "
Calculus of the Bladder	2 "
Gonorrhœa	30 "
Paraphimosis	2 "
Epididymitis	6 "
Gleet	6 "
Urinary Fistula	3 "
Stricture	4 "

Diseases of the Generative System:—

Hydrocele	4 "
Orchitis	2 "
Spermatorrhœa	6 "
Fibrous Tumour of Uterus	1 "
Leucorrhœa	4 "
Pruritus Vulvæ	1 "
Amenorrhœa	6 "
Dysmenorrhœa	3 "

Diseases of the Organs of Locomotion:—

Necrosis	5 "
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Tumour	2 cases.
Synovitis	6 "
Caries of Spine	2 "
Abscess	4 "

Diseases of the Cellular Tissue:—

Abscess	18 "
Slough	2 "

Diseases of the Cutaneous System:—

Psoriasis	2 "
Herpes	2 "
Eczema	10 "
Impetigo	2 "
Rupia	1 "
Ecthyma	6 "
Acne	6 "
Ichthyosis	1 "
Ulcer	164 "
Boil	15 "
Whitlow	11 "
Condyloma	2 "
Cheloid	2 "
Tinea Circinata	68 "
Scabies	45 "

Poisons:—

Opium	2 "
" Smoking	19 "

Injuries:—

Wounds, Contused	14 "
" Incised	6 "
" Punctured	3 "
Dislocation	1 "
Traumatic Gangrene	2 "
Burns	2 "
Lesions	8 "

Most of the patients come from the towns and villages of the large rice and sugar growing plain which lies between the south-west coast of Formosa and the central range of mountains. Occasionally, people come from the Pescadores, Lambay Island, and a few, sometimes savages, from the east coast of Formosa.

No cases out of the ordinary run of general practice of any interest to the profession were treated.

Small-pox, as formerly, was prevalent during the spring months, but before many years the disease must become greatly modified by vaccination, which the natives most enthusiastically run after. In connection with the Hospital no fewer than five vaccinators are busily engaged in the surrounding districts.

F—Dr. Alexander JAMIESON's Report on the Health of Shanghai for the
Half-year ended 31st March, 1877.

ABSTRACT of Meteorological Observations taken at the Observatory of the Jesuit Mission at
Sikawei, for the six months ended 31st March 1877. Latitude, $31^{\circ} 12' 30''$ N. Longitude
E. of Greenwich, $8^{\text{h}} 5^{\text{m}} 44.63^{\text{s}}$.

DATE.	Barometer at 0° C.	THERMOMETER.		Elastic Force of Vapour.	Humidi- ty.	Ozone.	Evapora- tion during 24 hours.	Rainfall in 24 hours.	Velocity of Wind.	Prevailing Wind.	REMARKS.
		Temperature in Shade, observed at intervals of three hours.	Extreme Temperature in Shade.								
1876-77.	mm	°C.	°C.	mm of Mercury.	0-100.	0-21.	mm	mm	M. per sec.		
Oct.....	Max... 769.31 Mean 764.43 Min... 758.91 Range 10.40	27.90 17.76 8.50 19.40	28.90 18.72 6.20 22.70	16.49 11.68 7.00 9.49	100.0 78.7 26.0 74.0	12.0 7.1 0.0 12.0	5.28 100.69* 1.51 3.77	8.1 18.6* 0.1	10.10 1.95 0.00	N. 37° 4 E.	On the 21st, at 3 P.M., a magnifi- cent meteor of considerable size appeared towards the N.E., at an altitude of 30°. It was blue, and left a luminous track. It descended slowly and irregularly, increasing in size and rapidly changing to red. At about 5° above the horizon, it became less dense and stretched out, and then disappeared without report. It was visible for about half a minute.
Nov.....	Max... 771.53 Mean 766.44 Min... 760.96 Range 10.57	21.40 9.95 -1.20 22.60	22.50 10.50 -1.90 24.40	11.76 6.40 2.68 9.08	100.0 74.1 19.0 81.0	15.0 7.9 1.0 14.0	5.40 80.57* 0.26 5.14	28.9 28.4* 0.1	13.00 2.20 0.00	N. 5° 9 W.	On the 2nd at 4 A.M. an extremely thick mist. Lunar rainbow, of white colour, very distinct.
Dec.....	Max... 777.13 Mean 769.62 Min... 763.97 Range 13.16	16.60 6.77 -3.10 19.70	16.80 7.31 -3.40 20.20	9.17 6.00 3.10 6.07	100.0 81.2 38.0 62.0	18.0 8.3 3.0 15.0	2.96 62.55* 0.44 2.52	7.8 19.6* 0.3	10.90 2.55 0.00	N. 7° 0 E.	25th.—Tempest; maximum velocity from 3 to 3.30 P.M., during which half-hour the wind travelled 22.8 km. (12.66 m. per sec.)
Jany....	Max... 781.54 Mean 771.88 Min... 763.45 Range 18.09	16.10 3.09 -5.20 21.30	16.60 3.68 -6.80 23.40	10.10 4.51 1.30 8.80	100.0 76.5 15.0 85.0	21.0 13.4 7.0 14.0	4.40 48.53* 0.26 4.14	10.6 51.3* 0.8	15.50 3.85 0.00	N. 0° 3 E.	On the 1st, a hurricane occurred in the morning. At 9.30 the velocity of the wind was 20 m. per sec. 14th, 17th, 25th and 27th—Snow fell.
Feb.....	Max... 778.47 Mean 769.97 Min... 757.83 Range 20.64	20.0 2.52 -7.00 27.00	21.60 6.19 -7.10 28.70	9.20 4.11 1.20 8.00	100.0 73.3 29.0 71.0	21.0 12.8 5.0 16.0	4.60 3. 0.33 4.27	21.5 88.0* 1.0	13.96 4.13 0.00	N 32° 0 W.	Snow fell on the 5th, 10th and 24th. The air was remarkably dry from the 11th to the 15th.
March...	Max... 776.49 Mean 766.09 Min... 754.35 Range 22.14	25.00 7.60 -1.20 26.20	26.60 8.30 -1.90 28.50	12.70 5.39 1.60 11.10	100.0 69.8 15.0 85.0	17.80 12.40 5.20 12.60	8.68 97.78* 0.04 8.64	13.7 57.8* 0.1	12.22 3.16 0.00	N 36° 7 W.	4th.—Hail. 10th.—Magnetic dis- turbance. Storms on the 19th, 20th, 22nd and 30th. On the 21st a dust storm.

* Total for month.

N.B.—The maxima and minima under each month are those noted at the actual hour of observation, except in the cases of *Rain-
fall* and *Evaporation*, where the maxima and minima mark the greatest and least amounts for one period of 24 hours. The means are those
of the month, but it will be noticed that under the same two headings the *total* for the month is given instead of the *mean*.

RULES.

To reduce millimètres to inches, multiply by 3,937 and move the decimal point five places to the left.

To reduce degrees C. to degrees F., multiply by 9, divide by 5 and add 32.

To reduce mètres per second to miles per hour, multiply by 9 and divide by 4.

The diseases prevalent during the half-year were the malarious fevers, chest affections, small-pox, dysentery and diarrhœa. The group of bowel affections proved remarkably benign. There were no deaths from enteric fever in hospital, and only one in private practice. During October several cases of sun malaise came under observation, but the affection was usually linked to some error in diet. Acute diseases of the respiratory organs were, I think, more common and more severe during the winter months than is usual. In my own practice I had one case of extremely acute inflammation of the soft palate, pillars and tonsils, with a considerable amount of laryngeal trouble, the extent or precise nature of which could not be ascertained. On the third day of the disease gangrene appeared imminent, and there was so much interference with respiration that at one moment tracheotomy seemed unavoidable. However, free leeching and bran poultices externally, with deep incisions and constant steam inhalations internally, moderated the symptoms, and the patient made a thorough but lingering recovery. Stimulants were largely administered as soon as some facility in swallowing was obtained. Among children there was almost an epidemic of what would have been "mumps" if the glandular swelling had been attended by fever, which it was not in any of the cases which came under my notice.

BURIAL RETURN OF FOREIGNERS FOR THE HALF YEAR ENDED 31ST MARCH 1877.

CAUSE OF DEATH.	OCTOBER.	NOVEMBER.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	TOTAL.
Heart Disease.....	1*†	—	—	—	1†	1¶	3
Typhoid Fever.....	1	—	—	—	—	—	1
Dropsy.....	1‡†	—	—	—	—	—	1
Dysentery.....	1†	—	—	—	1 1†	—	3
Marasmus.....	1§	—	—	—	—	—	1
Phthisis.....	1‡†	—	—	—	1†	—	2
Uterine Tumour.....	f1	—	—	—	—	—	1
Diarrhœa.....	—	1†	—	—	—	—	1
Malarious Fever.....	—	1†	—	—	—	—	1
Diphtheria.....	—	1	—	—	—	—	1
Softening of Brain.....	—	—	1	—	—	—	1
Renal Abscess.....	—	—	1	—	—	—	1
Spinal Meningitis.....	—	—	1	—	—	—	1
Thoracic Aneurism.....	—	—	1	—	—	—	1
Alcoholism.....	—	—	1	—	—	1†	2
Empyema.....	—	—	—	1	—	—	1
Bright's Disease.....	—	—	—	1	—	—	1
Pneumonia.....	—	—	—	1	—	—	1
Cerebral Effusion.....	—	—	—	1†	—	1†	2
Dementia.....	—	—	—	—	1	1	2
Capillary Bronchitis.....	—	—	—	—	—	1	1
Accident.....	—	—	—	1†**	2††† 1†**	—	4
Suicide.....	—	1	—	—	—	—	1
Uncertified.....	2†	1†	—	1 1§	—	1†	6
TOTAL.....	9	5	5	7	8	6	40

* Died at sea, but was buried in Shanghai. † Not resident. ‡ Malay sailor. § Infant. || Man aged 75, long a sufferer from prostatic disease. ¶ "Supposed to be heart disease." ** Fracture of skull. †† Charcoal suffocation on board *John Pott*.

From the above table it will be seen that the deaths among residents numbered 20. Subtracting two infants each under six months old, and one case of suicide, the number of deaths from disease among adult foreign residents is reduced to 17 (16 males and 1 female) as against 16 (14 males and 2 females) during the same period of last year.

The 17 deaths among resident adults may be arranged as follows:—

Diseases of Brain and Cord	4	Diphtheria	1	Alcoholism	1
Heart Disease(?) and Aneurism	2	Enteric Fever	1	Uterine Tumour	1
Diseases of the Lungs	3	Dysentery	1	Uncertified	1
		Diseases of the Kidneys	2		

The cases of diphtheria and spinal meningitis are described in the annual Report of the Shanghai General Hospital as being neither of them "typical, either during life or on examination after death." The age of the patient who died of diphtheria was 33. The patient who died from rupture of an aneurism of the thoracic aorta was 37. The average age at death in eight cases of acute disease among residents where the age is noted on the certificate was 39½. It may further be observed that there was but one fatal case of dysentery among resident foreigners, and one case of typhoid, that the two fatal cases of phthisis were imported, and finally, that diseases of the brain and cord accounted for 23·53 per cent. of the adult mortality.

G.—Dr. MACKENZIE'S Report on the Health of Ningpo for the Year
ended 31st March, 1877.

DURING the past year the health of the foreign residents has been remarkably good, due, I have no doubt, in a great degree to the coolness of the summer, which permitted people to take more exercise than is customary among the majority of foreigners in the warm season.

The most serious case which came under my notice was one of apoplexy referred to in my last report.

I was sent for at 1.30 P.M. on the 27th of March to see a man who had taken a fit. I found him in an unconscious state, eyes open, pupils contracted, and insensible to touch; pulse 140 to 150. I was informed that "he was sitting at a table writing when his hand began to wander over the paper and he fell down unconscious." He remained in this state for about half an hour, when he could with great difficulty be roused, and complained of cramp in the legs, and a headache.

About half past four he had a fit of an epileptic nature, which lasted for about a minute. When he came out of this convulsion, he was unconscious and the muscles quite rigid; he was unable to swallow, and passed urine involuntarily. As his bowels had not been moved for some days, I administered an enema, which soon produced a copious stool. At 6 P.M. he had another fit, at 7 another, and again at 7.30. The fits continued up to about 1.30 A.M., at intervals of from 10 to 15 minutes. The pulse sometimes was imperceptible, at others bounding, full, soft and easily compressible. At 2 A.M. I managed to make him swallow a little beef tea, and at 2.30 I gave 25 grs. of bromide of potassium. During the remainder of the night he was very restless, moaning and throwing his arms about. Consciousness did not return till about 4 P.M. on the 28th, when he was able to recognize people and answer some questions. Towards night he began to wander and was much exhausted. I gave him 20 grs. of chloral, and ordered the dose to be repeated if he did not sleep. On the 29th, he was much the same, and had taken three doses of chloral during the night. He gradually improved in every way till the 4th of April, when he expressed himself as all right and had a great desire to go out for a walk. I told him he might go out for an hour, but to be careful and not tire himself. He foolishly stayed out for several hours, walking about in a hot sun, and at 4 P.M. I was called to see him as "the fits had returned." I found that the entire right half of the body was paralyzed. I put him on iodide and bromide of potassium, with a good nourishing diet, and gradually he improved. On the 29th April, under the advice of Dr. JOHNSTON of Shanghai, 20-grain doses of iodide of potassium by itself were administered three times a day, gradually increasing the dose to 40 grains. The improvement was steady and uninterrupted, and by the 16th of May he could walk with the assistance of a stick. He left Ningpo for England in the latter part of May, and by the time he arrived at home he was able to walk about without assistance of any kind. I lately saw a letter from him to one of his friends, and he writes as well as he ever did, and the only sign he has left of his severe illness is a slight dragging of his right leg. I refrain from making any remarks on his case as I have not his permission to publish a full history of it.

Two deaths occurred among the foreign community. One was that of a missionary who had passed the greater part of his life in hot climates, and died simply of old age. The other was a priest who had suffered frequently during the last ten years from the passage of gall-stones, and when I saw him, the day before his death, he was much exhausted and wasted, and in a dying state. I could do little more for him than administer sedatives to allay the excessive pain he endured. There have been several cases of rheumatism, but few of them of a severe nature.

Unfortunately, I had no preparation of salicine, nor could I procure any in Shanghai when I most wanted it. Intermittent fever was not so prevalent as in former years, and I have only seen three cases of dysentery. Instead of using the powder of ipecacuanha, I used the liquid extract, which I find more convenient and equally efficacious. One man suffered most severely from a sort of asthma brought on by inhaling dust from wheat while superintending the loading of a vessel. The chief officer of the same ship was attacked the evening after leaving the port, and he became so ill that, at one time, the captain thought of sending him back to Ningpo for medical advice. There have been about the usual number of cases of diarrhoea, most of them traceable to some indiscretion in the way of eating or drinking. No cases of syphilis have come under my notice and but few of gonorrhoea.

In concluding this meagre report I must thank Dr. BRERETON, of H.M.S. *Swinger*, for his kindness in consenting to attend to any of my patients who might require medical advice during my absence from Ningpo on account of sickness. I was fortunate also in obtaining the services of Dr. GEO. CHAS. COLES, who acted as my *locum tenens* for three months.

I do not give a meteorological report, as the instruments at the disposal of the Customs are not to be relied upon. I have made two attempts to get out instruments from home, but in both instances they came out in bad order. In my last report I omitted to mention that with the kind assistance of Dr. QUILLEY, of H.M.S. *Growler*, I amputated a Chinaman's leg by Carden's method. The man was suffering from the effects of frost-bite of the foot and leg, and was quite unable to work for months. The stump healed kindly, and now, fully two years after the operation, he is well and strong, and follows his occupation of mat-making, by which he supports a large family.
